THE ORANGE CONFERENCE

A MEETING OF THE

COOPERATIVE COMMITTEE ON LIBRARY BUILDING PLANS

HELD AT THE

PLANT OF SNEAD AND COMPANY

ORANGE, VIRGINIA

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Preface

The following report has been compiled from a stenotypist's record made by the Master Reporting Company, Inc., but it needs to be explained that owing to a train wreck the stenotypist was not present at the opening meeting of the Conference on Friday morning, October 26th. The report of that session is, therefore, meager and not dependable.

Charles W. David, Secretary.

FOREWORD

The Coöperative Committee on Library Building Plans was formed in 1944 for the purpose of improving the planning of university library buildings through a pooling of experience, ideas, and knowledge. It was our belief that the problems common to the planning of all university library buildings could be most effectively met by bringing into focus the best available expert opinion on these problems. The Committee has avoided the temptation to plan an ideal or model library building. It has recognized the diversity of purposes and methods existing among the varying institutions that form its constituency. It has tried to be helpful in a practical way, bringing to bear on a concrete local situation the best and most expert thought at its disposal. It is solely a deliberative and advisory group, informal in procedure, flexible in its plans and meetings, and probably both temporary and fluctuating in its existence and constituency. It is, in a sense, a self-constituted body. Though its membership is made up for the most part of librarians, with architects occasionally being invited to participate in its discussions, it is important to note that neither the American Library Association nor the American Institute of Architects is a sponsoring agency, though both of these national organizations have been interested and coöperative in the work of the Committee. Indeed, the Committee was formed neither by librarians nor architects, but by university presidents. Its work, therefore, should be regarded as another evidence of the growing tendency towards coöperation and away from competition among institutions of higher learning.

In 1944, President Harold W. Dodds of Princeton University addressed an invitation to the presidents of some fifteen colleges and universities in different parts of the country, inviting them to join in the formation of a committee that would address itself to the problems common to each of these institutions in the planning of its library buildings. The response to this appeal was unanimously affirmative. The organization meeting of the Committee was held at Princeton on December 15-16, 1944, and since then meetings have been held at Columbia, Missouri (April, 1945) and at Orange, Virginia (October, 1945), in addition to an informal meeting of a number of members of the Committee in June, 1945, held in New Jersey for the purpose of inspecting the buildings of the Bell Telephone Laboratories near Summit. The Committee's meetings have grown in size and interest. It is believed that, while the constituency of the Committee was confined in the beginning to those institutions that were planning to build new library buildings in the immediate postwar years, the representatives of these institutions are a fair cross section of the country's librarianship and scholarship, diverse in points of view, respective aims, and geographical location.

The Committee has recognized from the beginning that it has a responsibility beyond that of serving the particular needs of the institutions it represents. For this reason, the Committee has applied for and has received a grant from the Rockefeller Foundation which will enable it to prepare and distribute full reports of its meetings to all interested institutions and to prepare and publish a monograph-report that

should focus the best opinion available on such problems as: present educational trends as they apply to research libraries, technological trends as they apply or may be applied to library and scholarly uses, questions of library administration which affect and in turn are affected by library buildings, engineering data, and the relationships of librarians and architects in the preparatory steps leading to the planning of a library building. The demand for such reports, repeatedly expressed in communications to the Committee, is an indication of the existing need for studies addressed to the large problems confronting any institution that sets out to build a college or university library. The Committee is grateful for the opportunity thus presented by the grant from the Rockefeller Foundation to distribute some of the information and data that have informed its necessarily small meetings and to make them available to a larger audience.

The task of preparing the minutes of the meeting at Orange, Virginia, included herein, fell upon the heavily burdened but capable shoulders of its Secretary, Dr. Charles W. David. He has, at considerable effort, reduced the stenotypist's record of four hundred and fifty odd pages to a more manageable length, and I take great pleasure in expressing the Committee's gratitude to him for this service.

Julian P. Boyd, Chairman

OPENING SESSION, FRIDAY MORNING, OCTOBER 26TH

Julian P. Boyd, Librarian, Princeton University, presiding.

Members present: Julian P. Boyd (Librarian, Princeton University) Chairman, Charles W. David (Director of Libraries, University of Pennsylvania) Secretary, John E. Burchard (Director, Massachusetts Institute of Technology Library), Donald F. Cameron (Librarian, Rutgers University), Gilbert Doane (Librarian, University of Wisconsin), Ralph E. Ellsworth (Director of Libraries, State University of Iowa), C. W. Heaps (Physics Department, Rice Institute), W. H. Kerr (Librarian, Claremont Colleges), Keyes D. Metcalf (Director, Harvard University Library), Benjamin E. Powell (Librarian, University of Missouri), Charles E. Rush (Librarian, University of North Carolina).

Guests present on behalf of represented libraries: R. B. O'Connor, architect for Princeton University Library, and Mr. Baer, Turner Construction Company; Ralph Walker, architect, M.I.T. Library; Edgar Albright, architect, Rutgers University Library; Arthur T. Hamlin, Chief of Service to Readers, and John F. Harbeson, architect, University of Pennsylvania Library; Ricardo Quintana, Chairman of Library Committee, and Roger Kirchhoff, State Architect, University of Wisconsin; Virgil M. Hancher, President, F. W. Ambrose, Business Manager, G. L. Horner, architect, Earl E. Jones, architect, State University of Iowa; W. W. Watkin, professor of Architecture, and John F. Staub, architect, Rice Institute; A. M. Githens, architectural adviser, University of North Carolina Library.

Present on behalf of Snead and Company: Angus S. Macdonald, President, Arthur Landis, Vice President, Fred Walton, Engineering Assistant to the President, Mark Andrews, Sales Engineer, J. R. Bailey, Architect, William M. Randall, C. W. McPherson, J. A. Hebrente, W. B. O'Brien, Arthur Nelson.

Guests by invitation of Snead and Company: Charles Leopold, Engineer, Philadelphia, E. E. Seelye, Engineer, New York, G. D. Fish, Engineer, New York, George Howe, Deputy Commissioner, Public Buildings Administration, Washington, D.C.

The opening session was devoted primarily to a discussion of a model or "mock-up" of a new type of library construction which had been erected by Snead & Company and in which the meeting was held. Mr. Angus S. Macdonald, President of Snead & Company, was introduced and after appropriate and cordial words of welcome, he proceeded to comment on the model. He said he had long been interested in the question as to whether bookstacks of the traditional type were becoming anachronistic. Even stacks must be "dynamic." Carrels, one important innovation, were introduced by Harvard in 1914. The Library of Congress had long been interested in obtaining elasticity as evidenced by its central core stack, with a greatly reduced number of standard columns and large areas that can be free from obstacles. Mr. Githens had helped by his researches. Mr. Macdonald himself had written articles. In 1939 Colorado State

Teachers College at Greeley erected a library wing based on 9 ft columns in each direction. The uses of the space could be changed summer to winter and vice versa. Finally, Ralph Ellsworth had asked what could be done in the light of what is now known. The idea of this model and then the model itself resulted.

Cost is very important, if not a dominant factor, and Mr. Macdonald has concluded, after considerable study, that it costs a trifle less to store books in this type of construction than it does in regular bookstacks. The model module is 13½ x 19½ ft center to center with an 8 ft ceiling. Mr. Macdonald said that these dimensions might easily be increased to 20 ft x 25 ft and the ceiling height made 9 ft instead of 8 ft. The columns, girders and beams are all made hollow to carry air. With this size module in a 45 ft building height, you can get five stories against three of the old style. Costs of air conditioning vary with human occupancy and light used. The lower ceiling simplifies both lighting and air conditioning problems.

Question by Mr. Walker: "Is this structure going to be cheaper when you get it fireproofed? Beams must be fireproofed in New York."

Answer by Mr. Macdonald: "Snead is prepared to fireproof the steel. Architects favor dry fireproofing pre-cast."

The discussion then turned to fireproofing for libraries. Mr. Githens asked about the probability of fires in libraries. The 1911 New York State Library fire was the last big one in this country. The great fire in the British Museum bookstacks was the result of bombing. Public interest in fires is as to whether the occupants get out or not. The insurance companies seem to be chiefly interested in the contents. The actual hazard of fires in libraries is almost nil. What about smoke? Smoke would be there and do its harm whether you had fireproofing or not. Mr. Metcalf remarked that the stacks in Widener Library at Harvard are ten stories high with slits from floor to floor like a chimney the whole way up. Sometimes there are as many as 200 people in the stacks and 250 in other parts of the building. Mr. Metcalf felt that such a structure as the present module would be definitely safer than the Harvard stacks in the event of fire. Mr. Walker could find no reason for even insuring bookstacks. He has investigated many library fires.

A question was raised as to the effect of air conditioning on the fire hazard. It was suggested that the smoke hazard would probably be increased by air conditioning. However, Mr. Leopold suggested that the electric eye control in air conditioning can substantially stop the circulation of smoke. Mr. Ellsworth stated that he had given considerable attention to the fire problem and had concluded that they were not at all likely to have a fire in the stacks. Fire might break out in the reading areas where smoking is allowed or in a faculty office. Janitors' closets need to be carefully watched. Mr. Rush reported that at North Carolina smoking is permitted in every library room except the stack. Occasionally black spots appear on the floor covering as a result of cigarette sparks. This places no limitation on floor covering, except

perhaps to suggest the avoidance of cork. Mr. Githens remarked that basements should be entirely fireproofed.

Returning to the question of costs, Mr. Macdonald said that the comparative costs of the two types of construction should not be very different. Exposed steel is, of course, cheaper than fireproofed steel, but prefabrication makes for cheapness. The labor is transferred from the construction job to the shop. Floor areas are rapidly covered, no planking is needed, field hours are reduced. Mr. Baer inquired how many types of workmen are needed for this kind of construction. He acknowledged the advantages of getting prefabricated material delivered on the job. Mr. Macdonald said that the erection of such a structure is an iron worker's job. The tonnage of steel on this job is almost indistinguishable from the framework steel in regular construction. This particular module has a floor of 12 gauge steel. Anything thicker than 11 gauge steel makes an iron worker's job.

The discussion then turned to the question of precision. "Creeping" starts from the foundation. Will prefabrication obviate creeping? Mr. Fish said that with prefabrication creeping is very nearly obviated, being perhaps one-eighth of an inch in 40 or 50 feet. Mr. Macdonald said that the Library of Congress stack, with 300 x 150 ft overall dimension when finished, was within one-eighth of an inch of what the drawings showed. This is "shop" precision. Except for the roof and the upper story, exterior heat affects building expansion almost not at all. Expansion joints are needed at least every 300 feet. Mr. Walker inquired whether it was possible to build the exterior wall independently of the steel interior core, making the wall do the bearing job, and let the building "breathe" inside. This can be done up to 75 ft height. The expansion of the roof may also be free inside the walls.

Mr. Boyd asked if the module construction imposes more monotony. Princeton is obliged to build some monumental rooms. Mr. Ellsworth said, "Let's stick to the 'reliability' of this type of construction. We can come back to the 'validity' later."

A pre-cast vermiculite-asbestos floor slab in a metal frame was exhibited. Linoleum or other floor covering could be laid over these slabs. Two men were sent to the floor above the conference, where the vermiculite-asbestos slab had been used, to test whether the ceiling would be noisy. Noise of the walkers above came through as a slight tapping sound. Mr. Boyd remarked that the noise had been reduced since the last time he had visited Orange and seen the model. A question was raised as to whether the use of pre-cast slabs might cause cracking of the linoleum or other floor covering. The answer was that floor covering bonded on to the slabs perfectly will in cracking follow the pattern and be controllable.

There was some discussion of the subject of illumination in connection with air conditioning, but before it had gone far the session adjourned for a good lunch, to resume in the afternoon.

FRIDAY AFTERNOON SESSION, OCTOBER 26

Chairman Boyd called the meeting to order and asked for further discussion of the technical and engineering problems of the Snead model. This was to be followed by discussion of the Princeton plans. Mr. Leopold was introduced and asked to comment on the illumination of the module.

MR. LEOPOLD began by commenting on the heat given off by illumination and its effect on air-conditioning. "There is no such thing as cold light. Actually, a 20 watt fluorescent bulb is 25 watts of energy that appear in the form of heat. It is 25, because the auxiliary is not counted in the rating of the tube. A high electric load of this type is undesirable because it increases the basic quantitative design of the plant, and it increases the need for individual control. With a small light load per square foot in two adjacent areas, one fully occupied, one not, the difference in temperature between those areas may not be too large. If, however, there is a heavy light load or a heavy people concentration, in one area that is walled off from an adjacent lightly loaded one, they can't be supplied with the same quantity of air at the same temperature. Otherwise, there will be too great a difference in temperature.

"Curiously enough, the body is very sensitive to temperature. Starting from an optimum condition, you can afford a departure of 1.5 degrees plus or minus, and that is about all if you want to keep a group of people satisfied.

"The two problems with light are, to see obviously, and to keep heat release and power requirements to a minimum.

"This typical bay (pointing) figures out 4.5 watts per square foot. It would make necessary an air quantity that would be quite prohibitive for the column construction, particularly on the 23-foot bay. I am quite sure that this is extremely inefficient light. A much simpler system would have to be designed for lighting in order to have a conditioning system that was reasonable in cost.

"We should attempt to approach the efficiency of the bare tube and still keep the bare tube out of line of vision, if we use this system."

CHAIRMAN BOYD brought up the dual need in broad library stacks for some overall illumination and individually controlled light as needed.

MR. LEOPOLD: "The more constant the load, the easier the air conditioning problem, not the harder. It doesn't affect the size of your original air handling equipment. You have to allow for a peak anyhow. You will use little additional refrigeration, and there will be the waste of the light that isn't needed. That isn't very much. (Mr. Leopold criticized the state of the art and science of illumination.)

DR. DAVID: "Do I understand that you can't have this illumination, giving that much light load, and at the same time have columns of

this magnitude in a bay 23 feet in each direction, and have a successful air conditioning system?"

MR. LEOPOLD answered in the affirmative and said the arrangements would limit the floors to about three. For more floors a duplicate air conditioning system would be required.

MR. LEOPOLD: "I figure a starting velocity as high as 2000 feet, and tapering as you go up. There has been considerable loose conversation about high velocity. It can be used efficiently where a small portion of the total air is sent through the duct system. At the terminal there is installed a device which is actuated by this high velocity air and in which the final cooling of the air is done. An example is the Carrier Weathermaster system. It is applicable principally to a perimeter window installation. If you pass the air for the total cooling requirements up the column, you cannot afford these high pressures. The fans run approximately twelve or more hours a day all year around. This is a large power load."

MR. MACDONALD: "The Carrier people said that the high pressures that they use in the Weather Master system were due to the fact that they have very small ducts, in the neighborhood of 4" or 5" in diameter. With high pressures they are required to overcome the frictional loss in the long travel through the small duct. In big columns such as ours pressure in the nature of 6" or 7" is quite unnecessary. They might get down in the neighborhood of 1" instead."

MR. LEOPOLD: "That is absolutely true, but you are building up a power loss. I said 2000 feet per second, which is far in excess of the velocity that you would use in an ordinary 18" x 18" duct that you were running through a room."

"The simple scheme would be to take a portion of outdoor air and a portion of recirculated air, condition it, transmit it thru the columns and distribute it to the various bays. If high velocities are used, the problem of controlling and distributing the air to the ducts, where they branch from the columns, is greatly increased.

"In the high velocity system, as a rule only the fresh air, amounting to approximately one-third of the total, is conditioned at a central point. Since this is only a fraction of the total air, more power may be wasted in its transmission than in a conventional system. The conditioned fresh air is then distributed to local conditioning units which consist of a cabinet containing an injector and a coil. The injector receives the high pressure air and induces a local recirculation of a second stream of air from the room thru a coil which can either be heated or cooled, as required.

"You can devise means of increasing the velocity of the simple system, but you are going to complicate it. When I say that you start with 2000 feet, I think that is safe. I question very much that you would ever get up to 4000 or 5000 feet."

Mr. Leopold's figures were based on using alternate columns for supply and return whereas Mr. Macdonald planned to have every column supply and take out the exhaust at certain central locations or around the periphery of the building. Mr. Leopold's figures would then have to be doubled.

The lighting in the room of meeting was discussed, and the drop in foot candles to be expected with age was brought out. Mr. Leopold estimated a 30% drop, and guessed 2.5 watts per square foot as an economical installation. "I think you need all of 35 foot candles in fluorescent lighting, but believe you can get it with a lot less than 5 watts."

MR. LEOPOLD: "We must not be misled by these cold light statements. A 20-watt fluorescent light takes 25 watts which all appear as heat. Although the light source is extremely efficient as compared to a 15-watt or a 30-watt incandescent bulb, as the fluorescent gets larger it actually drops off a little in efficiency, and the incandescent light keeps on increasing."

MR. HARBESON brought up the question of the efficiency of fluorescent lighting in book stacks where there is much stopping and starting of the light. Mr. Macdonald answered by stating his lighting company advised against the fluorescent unless the light was to burn more than 2500 hours a year. Mr. Walton added that modern fluorescents had instantaneous starting.

MR. LEOPOLD: "I only want to caution against the assumption that because they are fluorescent, there isn't any heat to be picked up in the air conditioning system. If I have overstressed the point, I am sorry."

MR. FISH: "At the figure of 2.5 watts per square foot, Mr. Leopold, this amount of air conditioning for the vertical air displacement would take care of, shall we say, eight or ten stories on a 23 or 24-foot panel?"

MR. LEOPOLD: "Roughly, I would say that would take care of three or four stories on the 23-foot square panel, if using alternate panels -- or six or eight stories if using all for this type of occupancy.

"Relative to the return air problem, it is true that the return air distribution is by no means as critical as the supply. Returns may be located on the floor, in the wall, on the ceiling or any other place, but I can't deliver air into a louverless room with closed doors."

MR. MACDONALD stated they planned to put louvers in doors and panels also, if necessary. Problems including objectionably heavy drafts were discussed.

MR. LEOPOLD: "If with this method of construction, using a perforated ceiling, four walls are installed, the conditioning system

will not operate satisfactorily without excessive louvering of the wall as the perforated ceiling offers very little resistance to the flow of air and minor differences in pressure become important. A solution to the problem is either to erect the walls thru the ceiling and tight to the slab, or to install a local exhaust unit."

MR. MACDONALD: "We contemplate having that underneath the flange of each floor plate, having that come right down to the acoustical ceiling, so that there is a definite division there. You would have compartmentation."

MR. LEOPOLD then brought up the danger of uneven air distribution through the perforated ceiling and consequent dirt-darkening of small areas. He also stated that less air per square foot would be required in stack areas than in human occupancy areas.

MR. LEOPOLD: "If there is a floor whose use will be limited to book storage, even tho it be above or below floors used for greater occupancy, the air flow can be reduced to serve the stack area as long as it is so used."

MR. MACDONALD: "We contemplate dampering it off in areas which don't require so much air. When the area was changed, by using the damper you could adapt it to the other use by a very simple adjustment."

Discussion turned to the colors used in the room of meeting. Light colors and greys were considered best for lighting efficiency. Mr. Macdonald noted the firm of James A. McCutcheon (N.Y.) who are doing fine work in equipping libraries.

MR. O'CONNOR: "The lightness ratio between the material that you are working on, which is almost always approximately white, and the top of the desk makes a great deal of difference in the ease of reading. The lighter you get your table surface the easier it is on the eyes. With baked enamel finishes you can get a relative softness of color and still have a reasonably hard and smooth finish. You can still have the softness without going to the very high glaze."

MR. LEOPOLD: "In regard to heating, the ventilating air would be brought in at or below room temperature. As soon as the lights go on it should be below.

"There is no summer and winter on interior space if you take care of the perimeter warming. If the outside walls are insulated and a simple perimeter warming system is installed, you have no temperature loss overnight and it is not necessary to start your ventilating fans until people come in. The Bankers Life Building has a one-inch hot water pipe coming down the side of the window, under the sill and down, similarly serving 5 floors. The fans start in at just about room temperature about the time the people come in. In this case the heating pipe was installed between the insulation and the finished wall so that you have clean, smooth walls, no pipe showing, no grilles, and no maintenance. It was designed for plaster, but metal walls were ultimately used.

"Glass blocks are very hard to handle on a sun exposure. By the time the sun hits the inside surface, that surface gets hot and you have a radiator at face level. For a small window it is no particular problem to install a Venetian blind, but large glass areas are difficult to drape. The thermo-pane is generally more satisfactory."

Answering Mr. Metcalf's request for information on the effect of ceiling height on the cost of air conditioning, Mr. Leopold stated that they figured cost per square foot, as a rule, and made very little allowance for height.

MR. LEOPOLD: "As long as you don't have an abnormally difficult ceiling requiring broad, flat ducts, it doesn't make much difference. For ceilings as low as this, unless it is an organized system such as this, costs would go up. One great advantage of this organized system is that horizontal air distribution would be obtained at lower cost. From 10 feet up to 15 feet there is no difference in the cost per square foot of air conditioning. If you go below that, your cost tends to mount, because you must have more outlets instead of using a few outlets and blowing a great distance.

"The big problems with low ceilings are the problems of temperature control. That is why I stress the point of limiting the light loads.

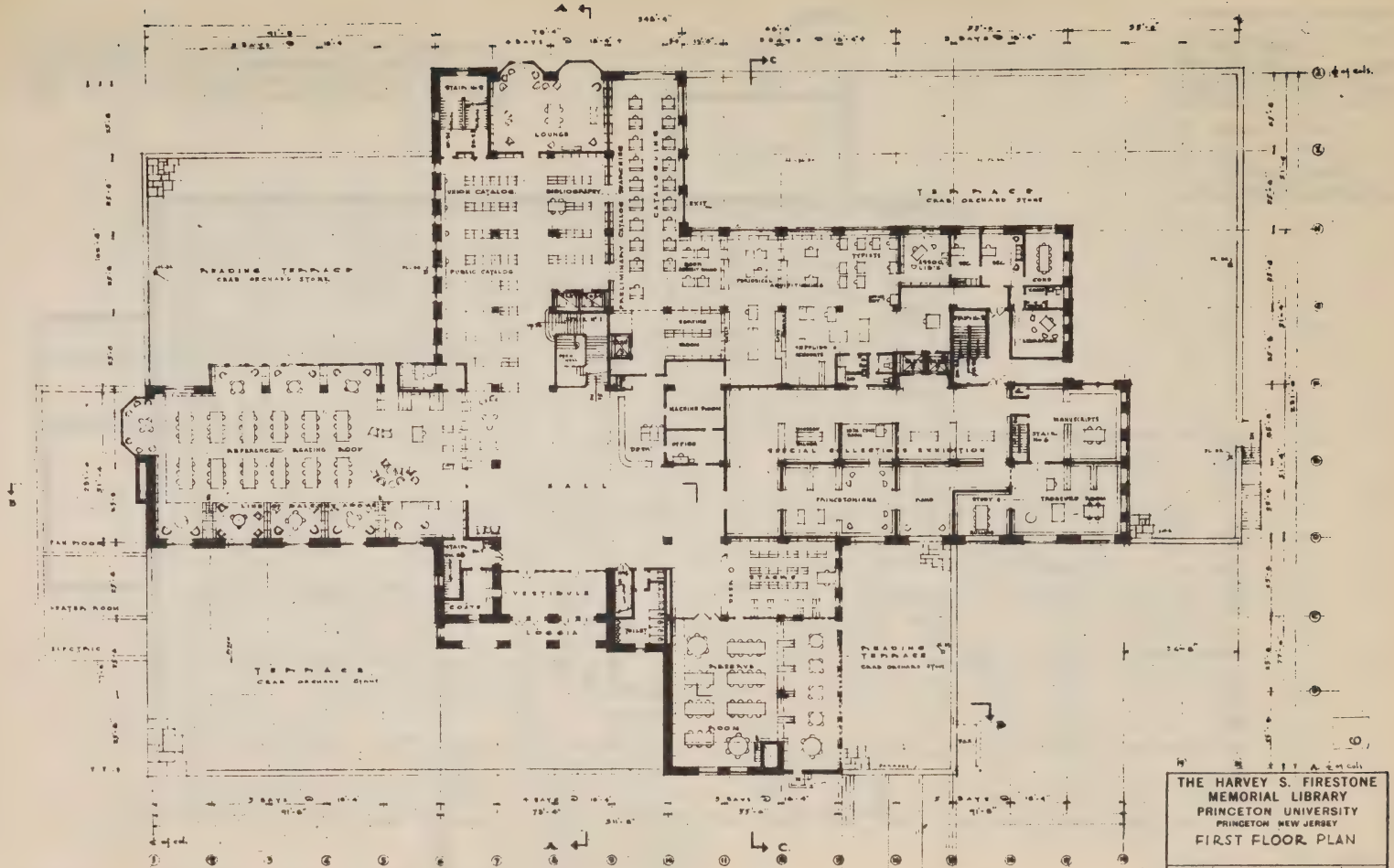
"One other point. I think you should recognize that where there are known rooms of constant use, they probably would be better off divorced from such a system and arranged contiguous to the corridor and have their own system.

"I have been doing some calculating on the means of reducing air quantity greatly by actually cooling the structure. I considered both liquid and gas as means of cooling. I conditioned a private museum some years ago that had a very low light load and massive construction. I installed a dehydrating unit only, figuring that it would deliver dry air at room temperature and would hold the humidity down. I figured that the building would tend to assume a 3 or 4 degree higher than average temperature day and night, and that is about what happened.

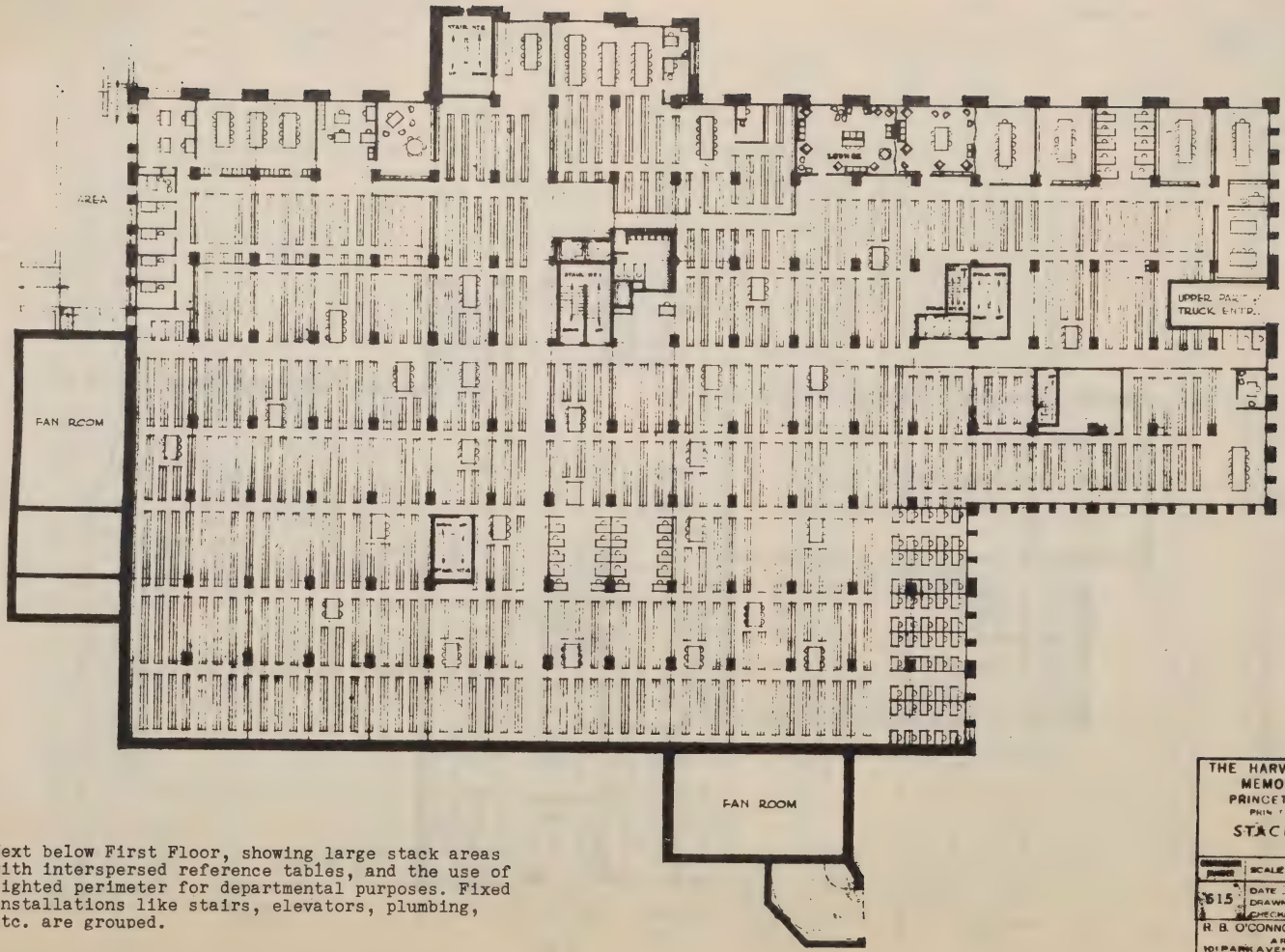
"I think the module system will work quite well even without complete air conditioning. It would be advisable to operate the ventilation twenty-four hours a day in hot weather, to take advantage of the heat storage affecting the structure. The quantity of air that is right for air conditioning is pretty nearly right for 24-hour ventilation."

The chairman then called on Mr. O'Connor to present the Princeton plans, postponing further questioning of Mr. Leopold until later.

MR. O'CONNOR (showing plans): "In connection with the Princeton library, one of the important problems was the psychological one of getting out the present conceptions that the faculty might have as to what sort of plan they wanted. After that there was gradually a crystallization of the general theory on which the library is now planned. After



The wings radiate around the central Hall and Desk. The Catalogue, opposite entrance, adjoins Cataloguing and Administration at upper right, and Reading Room at left. Special Collections are at center right; Reserve Room at bottom.



Next below First Floor, showing large stack areas with interspersed reference tables, and the use of lighted perimeter for departmental purposes. Fixed installations like stairs, elevators, plumbing, etc. are grouped.

THE HARVEY S. FIRESTONE MEMORIAL LIBRARY
PRINCETON UNIVERSITY
PRINCETON NEW JERSEY
STACK FLOOR A

PROJECT NUMBER	SCALE 1/8" = 1'-0"	DRAWING NUMBER
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R. B. O'CONNOR & W. H. KILHAM JR.
ARCHITECTS
101 PARK AVENUE NEW YORK CITY

the theory had been pretty well approved, in practice, as frequently happens, some of the details came in for rather considerable questioning.

"We came to the conclusion that the obvious point of entrance was to the southwest corner on account of the fact that the campus generally extends south and west. One of the principal points that we were anxious to accomplish was to provide a tie architecturally between the new library, the chapel, and the old library. That has some difficulties in view of the fact that there is a wide disparity in some of the architectural detail of those buildings. We have tried to develop the plans so that they would meet the actual practical requirements of the library, and to date we have completely sidestepped the question of exterior design other than en masse. I believe that the actual Gothic that develops on the exterior, if it is Gothic, will be rather a considerable cry from the more elaborate of the Gothic structures on the campus. So far as the interior plan and the interior elevational design are concerned, the building will be completely modern.

"There are two levels of the superstructure of the building. The general principle is that the great mass of the stacks is below the entrance level. It is roughly 350 feet by 250 feet. We have an absolutely modular unit through the entire building, which carries up in spite of the fact that the exterior wall of the first, second, and third floors is very much more articulated than the outline of the stack floors. In principle the faculty were pretty well agreed that the stacks should be a unified stack with the greatest unity in its disposition and that there should be departmental areas (divided into teaching rooms and study rooms) in the superstructure of the building. However, to save money we had to put a good deal of the departmental space around the perimeter of the stack floors. As the plans were developed it proved that the faculty liked that arrangement so much there has been some re-study to put some of the stacks which formed a more or less independent unit in the superstructure of the building. Those stacks amount to something like 80,000 to 100,000 volumes. What started out as a mere expedient really has developed into an important element of the plan.

"We tried to design the main stairs so that students will use the stairs in preference to the elevators, which are back of the stairs. We deliberately made it harder to get to the elevators."

Questioned, Mr. O'Connor said the three floors of underground stacks would extend well beyond the periphery of the superstructure.

"The stack floors are 9'1" from floor to floor, which gives us 8'4" under the slab. We started with 7'6" clear height, then took the depth of the girder and the coverage of fireproofing and the ordinary floor, which brought us up to the 9'1". The extreme suggestion has been made to raise it a foot, from 8'4" to 9'4". I think that is unnecessary."

CHAIRMAN BOYD: "The reason for that is the fact that if we move the departmental areas down from levels 2 and 3 to levels A and B of the stacks, some members of the faculty feel that 8'4" is not enough.

One of those conference rooms, for example, will be three bays, 25 feet one way and 56 feet another way."

MR. O'CONNOR brought out the fact that the ceiling height is approximately one foot more in the superstructure, at least on the second and third floors.

MR. O'CONNOR: "It was largely that where we had designed the higher ceilings about 9'4" we had originally intended to put the so-called departmental areas. With the possibility of completely natural light and air, we were deliberately raising the ceiling a foot above what we were doing in the standard stacks. When we put more of the conference and seminar rooms down in the stacks, we had a feeling that we should raise the stack floor, bring it up to the same height as we now have on the second and third floors."

MR. O'CONNOR: "To go back again to the entrance hall, which is our focal unit, to the left is the main reference reading room designed to hold 200 seats. To the right is the reserve book reading room. Over in the wing to the right is a series of special collection rooms. Over in the corner are the manuscript room and the treasure room. There is a passage with special exhibitions also along the halls which leads down to the manuscript and treasure rooms and also gives access at this end to the librarian's office and the assistant librarian's office.

"The total seating capacity of the library is approximately 1500. Of this 200 seats are in the main reference room, 100 in the reserve room, and the rest of it is scattered around through the work and seminar rooms and the carrels (nearly 600), and the work areas throughout the stacks. That works out somewhat more than 50 per cent of the total college or university enrollment, the undergraduate being normally 2400 and the graduate school 250. I don't think that will be held to immediately postwar, but in policy that is what the university hopes to maintain. Everything on the campus is set up on that basis.

"Books are received at B level. A truck can back in and could be locked in there overnight if it had not been unloaded. This truck entrance also forms a port where the truck for distributing books to departmental libraries can be housed. Having brought the truck in we go through unpacking and fumigating, then up on the freight elevator to the main floor. The books go through in a straight line, through the checking of the orders, finally in to the cataloguing. The card goes into the catalogue, and the book goes to the sorting room adjacent to the main desk. Everything that is to be shelved comes to the sorting room, which is right in the center, and then is taken on a lift to the floor where it is shelved."

CHAIRMAN BOYD: "That feature has met with general approval. It brings out into public view all the bibliographical apparatus, which had been inside the cataloguing department. They are next to the catalogue, next to circulation, etc."

MR. O'CONNOR: "The reference librarian controls the room pretty completely. He has a private office immediately next to the building catalogue."

CHAIRMAN BOYD: "Some of the librarians at Princeton have questioned the joining of the reserve and the main circulation desk and think that we ought to have a complete separation."

DR. DAVID: "You would not save anything in the long run as you will have to have an attendant in service. If you can, you should limit the space in which they are shut in on shelves and keep it as nearly open shelves as possible. There will always be a small collection of books that have to be controlled, but keep the great mass of the books in the reserve book room on open shelves."

MR. DOANE: "We have very limited capacity. Our reserve room seats only 250, of which approximately 50 per cent are using their own textbooks, using it as a study hall. We have about 4000 volumes on reserve. If the faculty estimates are correct, it will have to be more than doubled if we have adequate space to handle them and a room in which they can be used.

"Apropos of your reserve collection outside your reserve room, we were forced to do that at Nebraska. We had absolutely no supervision in the reserve reading room whatever. They got their books outside that room and went in the room to use them. We had astoundingly few criticisms of noise and disturbance in that room. I became convinced that it wasn't necessary to have the old-fashioned type of supervision in a reserve book room and that it was more convenient to shelve the collection outside."

CHAIRMAN BOYD: "One question I have about the reserve book room is whether we need it at all. We need, of course, a reserve book desk, but the seating capacity is so great throughout the building that the seating problem can be taken care of. We don't care where they take the books, of course."

MR. O'CONNOR then continued the discussion of the Princeton plans by indicating the sectional or departmental areas and adjacent stacks, with possible locations of work areas. These stack work areas are intended to be varied in size and treatment, and are formed by the removal of small sections of shelving.

MR. O'CONNOR: "In many cases it would be nothing but simply a stop in the shelving itself. In other cases, such as possibly the newspaper room, it might be completely enclosed but still occur in the middle of the newspaper stack."

CHAIRMAN BOYD: "The departmental allocation as we have fixed it at present brings history, politics, and economics all together adjacent to the main classifications in those fields. Contiguous to economics will be industrial relations, corporate finance, international

finance, and public administration. That is a fairly homogeneous arrangement of stacks and departmental usage."

MR. O'CONNOR: "We started out with a stack capacity of 2,000,000 volumes. Then we took out about 500,000 and converted it into departmental space in order to cut down cubage. Then gradually, by increases here and there, we recovered approximately 250,000. So, the net amount as of these plans is approximately 1,750,000 (allowing about 25% breathing room on shelves). It is based on approximately 75% growth over the present 1,000,000 volumes.

"The total height of the main reading room is 21 feet clear. That is in a separate wing, and we are not held except by covering up windows on the third floor. The reserve reading room is approximately the same height as the hung ceiling. However, the structural ceiling permits the entire room to be converted in the future into a second floor as well, in place of the large open room. So, the structural height is actually the sum of the first floor, which is 14 feet from the floor to the second floor, plus the 9 feet or thereabouts for the second floor. It is about 24 or 25 feet from the floor of the reserve reading room to the top of the roof ceiling on that wing.

"We can do the same thing in the main reading room, but there seems to be considerably more belief that the reserve reading room might be converted into departmental space. It is a little easier to do in the case of the reserve reading room than the general reading room.

"The catalogue room and other reading rooms are 14 feet floor to floor, which gives us a net of about 11 feet or 11'6". We distribute the ventilating for the stack floors at B level ceiling at the present time, which takes us up one floor and takes us down one floor. On the superstructure we distribute at two points, at the ceiling of the first floor and at the ceiling level of the top floor. That is still subject to a good deal of further study.

"The column centers are eighteen plus a few inches by 25 feet apart. The basis of that was about a 3-foot module in length and 4'6" center to center of the stacks. So, the 19 feet is based on 4'6" center to center, and the 25 feet is based on an even 3-foot stack section plus the normal structural column and its associated ducts. In other words, we are doing with this plan the same thing in principle that the Snead model here does through the actual column construction."

MR. HOWE asked whether the stacks were put underground because of desirability or because of site restrictions.

MR. O'CONNOR: "I can't see any objection to underground stacks, particularly if you get as much lighted perimeter as we actually get. We have a complete north lighted perimeter for the three stack levels. That was one reason why it seemed advisable to cut out the fourth level of stacks. This did a number of things for us. It was possible to get gravity drainage into the sewer connections, instead of

pump drainage, and it gave all of our stack floors at least the complete north elevation natural lighting. The stack windows will probably be sealed. We might put a metal and glass partition entirely across, and ventilate the stack part separate from the window part. That is now being studied. If we jack up the humidity in the wintertime, which is highly desirable for the books, to keep it as near 50 per cent relative humidity as possible, we will have the serious question of fogging the windows. Fifty per cent is theoretically ideal, according to the Bureau of Standards, but it seems to me a little high."

MR. LEOPOLD: "I don't think you will find there is any noticeable disintegration over a reasonable period of years until one goes considerably below 30. You can go below 30 per cent for a few days as it takes many days for a change in humidity to penetrate a book. In winter it would be practical to hold 30 per cent, which in the Princeton climate would take care of 80 per cent of the winter weather, and then have a control which automatically lowers the humidity setting for those few cold days. A little fog doesn't matter, but at 50% you will have water running on extremely cold days."

MR. O'CONNOR: "Originally C level was almost entirely a series of bays of carrels, with approximately ten to twelve carrels in each, with the light at the end. Now that the departmental seminars have been located there, we are undecided as to just where those carrels had best be placed. The feeling has been that it was more important to bring the departmental areas down into the stacks than it was that the carrels should have direct outside light. I think that whatever partitioning is added should have a very high percentage of glass in it so that you would get some light through, even though it might be obscured glass. In these particular plans there was a higher percentage of carrels on this floor than there was on any of the other floors, but now the tendency is to have the carrels more generally distributed as the departmental areas become more generally distributed. Any library is up against the problem of quite varying numbers of men in each department, who may require carrels. So, we must keep it generalized enough, and have large rooms consequently, to take up that slack."

MR. O'CONNOR elaborated on carrels in a series of bays. A bay is an area roughly 18' x 25', defined by four columns. A line of carrels runs down each side, with a large window at one end and a door or an opening at the other end.

MR. O'CONNOR: "We haven't come to agreement on the type of lighting that the carrels should have. We are definitely tending toward leaving the upper part of the carrels completely open for circulation of air and to have louvred lower parts to the partitions. Students and people on the teaching staff differed greatly on the question of doors or no doors on the carrels. We expect to have a sliding door which can be taken off, and we also plan to have a type of lock which is both combination for the student and pass key for the administration, so that neither one will have to do the thing which is difficult for him. In other words, the students are always losing their keys and it is hard to

try to get into the places to check the books if you have a different key for each one."

CHAIRMAN BOYD: "Regarding our stack capacity, we started out with a calculation of 2,600,000 volumes for a twenty-five year period. The 2,000,000 figure was a compromise. I think the departmental space is going to encroach on the stack space. The departmental space has been assessed pretty carefully by individual consultation with every department on the campus, but some, as all of you who deal with departments know, are very expansive and others are less so. With 1,750,000 stack capacity, we now have about 1,000,000 volumes for the entire library system. The departmental libraries will be the same, although some of them will be reduced and will send their books back to the main library. We will probably put in this building in the neighborhood of 750,000 volumes at the beginning. That will give us a growth possibility of more than 100 per cent."

DR. DAVID: "I get the impression that you set out in the plan to put stacks more or less underground, that you thought of them as stacks and conceived of them in terms of traditional ceiling height of stacks, that over that you were going to have a departmental superstructure, and that in some way you arrived at the conclusion that you needed heights running up to 9, 11, 21, and even 24 feet in that superstructure area. Actually, when you come to the allocation of space, you have moved departmental area of the sort that you once thought required 11 or 14 feet, down to 6, 7, or 8 feet, and people are perfectly content. I get an impression of a great waste of cubage with high ceilings in the superstructure."

CHAIRMAN BOYD: "That waste is necessary in certain areas. In fact, it is inevitable not only because of architectural considerations, but also because of the memorial nature of the building. Another thing that must be borne in mind is the fact that this superstructure is relatively small. The loss in cubage there is not great. The three permanent areas of real height are: the reserve book room, which can be converted; the main entrance hall, which is quite small; and the general reading room. The general reading room has a mezzanine around two sides, I believe."

MR. QUINTANA: "Why can't a ceiling as low as nine feet seat 200 people?"

CHAIRMAN BOYD: "I am not the one to answer that. Of course, you can put 200 people in that kind of space if you have enough bays together, but what kind of architecture are you going to have? You can't have a room 100 feet one way and 40 feet another, with a nine foot ceiling height, that would look like a memorial room. At least, I don't think you could."

MR. O'CONNOR: "I don't mind going out on the limb far enough to say I think it would be perfectly dreadful to have a large room with such a low ceiling. You would have such an impression of claustrophobia

that it would be dreadful. I think you who would work in those buildings would be the first to object to it."

MR. HORNER: "We have a lecture room in the basement of the Fine Arts Building, and the ceiling height is 8 feet at the back and about 10 feet at the front. The room is 42' x 77'. I don't believe anybody had claustrophobia in there. In fact, it is considered one of the best lecture rooms we have. There are four columns in the room at the sides, but they don't interfere with the view of the screen in the front of the room. The circulation of air is all right. We introduce the air in the front and pull it across the audience and take it out at the back. There is no natural light."

CHAIRMAN BOYD then stated, in response to questions, that natural light was to be used in the superstructure. The reference room is expected to have about 30,000 volumes, in alcoves around the wall and the mezzanine. There will be no periodical room as such except an open work space in the stack adjacent to the bound files of general magazines. There will be no attendant.

CHAIRMAN BOYD: "As for the old library, Chancellor Green, I think, is intended for the department of music. Pyne will be office space -- administrative offices and departmental offices."

MR. QUINTANA: "If you look into the future a hundred years, do you anticipate expanding the central building stack space or do you consider the possibility of a depository outside the main building?"

CHAIRMAN BOYD: "Both. It can expand to the north. We certainly have no objection to the depository system and we intend definitely to develop the idea."

MR. O'CONNOR: "The original program was to start out with 2,000,000 working volumes and, as necessary, add 2,000,000 more, making a total of 4,000,000. We believe in our office that you can get a great many more because the rate of growth of the above-grade uses is probably very much smaller than the growth of stack space. Consequently, we would then bring the stacks up to the first floor and above, if necessary, and greatly increase the potential capacity."

CHAIRMAN BOYD: "On the question of the deposit library, I have just held a consultation with Mr. Cameron and we have come to a firm agreement not on the deposit library but on the question of establishing in New Jersey a cooperative bindery.

"We had planned in this building to establish a bindery on level C or B, but if this scheme goes through, we will probably set it up in a separate building.

"The general current periodicals will go in the general reference room. The more specialized periodicals will go in the departmental areas, in the conference rooms, and in the smaller units of the depart-

ments, although I believe our reference librarian is strongly in favor of centralizing all of them."

MR. O'CONNOR: "I had a long conference with Mr. Barnes at the Library of Congress on air conditioning. We were talking about the degree of humidity control that was either essential or desirable in a library. He said that in the old building they still do not have air conditioning. They have found that in certain areas they got mildew in the very humid summer months, whereas in other areas of the same floor, relatively closely adjacent, they got no mildew at all. The Bureau of Standards had worked on it without really proving anything. Mr. Barnes had finally come to the conclusion, after a long period of experimentation, that mildew formed in areas which were very tightly filled with books and therefore with reduced circulation of air. These mildew areas formed under the same temperature and humidity conditions that existed elsewhere in the floor. He said that he found out afterwards that the same thing had occurred in a big plant that Carrier had air conditioned. They got mildew where there was a lack of circulation. Mr. Barnes gave it as his opinion that circulation of air, irrespective of any humidity control, was almost sure proof against mildew."

MR. WALKER: "The superintendent of the Morgan Library in New York said they wanted moisture in that library. When they open the windows wide they accelerate the fans so as to be sure to get circulation through the stacks. The moisture coming in and being violently agitated in the library didn't cause mildew. That bears out the statement you have just made."

MR. O'CONNOR stated that the Princeton stack not covered by superstructure would presumably have a flat terrace over it. The finish of that would very likely be some kind of paving material, whether roof tile or stone as yet undecided.

MR. O'CONNOR was not afraid of water working into the stack, although he was not prepared to give construction details.

MR. MACDONALD: "In that connection I know of a roof installation of 2x4's laid together side by side, a laminated roof, with tar and felt, and then 8 inches of sod. It has never leaked a drop. In fact, you dig down through the sod, and the tar and felt is just as bright as the day it was put on. Protected from the sunlight, it will last indefinitely."

MR. O'CONNOR: "Tar and felt, even subjected to sunlight, are excellent material. It has been our experience that where you are most likely to have trouble with flat roofs is where you have a protecting material like tile, because there is frequently an infinitesimal shrinkage in the individual cracks between the tiles which tends to fill up somewhat with dust, and it gradually consolidates, and each time it expands and contracts it doesn't contract quite to the same point it started from originally. You do get a creeping on the paved decks which has to be guarded against very carefully."

MR. WALKER: "What do the librarians think of this kind of stack against the vertical stack where you have many more floors rather than having them all spread out over 350 feet?"

MR. METCALF: "I brought up that question in my memorandum because I wanted to know. There are a good many factors, of course. If you are trying to have carrels that have outside light, you want to have as large a perimeter as possible, and that means having more stack levels. If you don't worry about that, it is a different situation. If you can have large stack levels and have them comparatively simple in design so that you won't get lost, that helps a good deal from the administrative point of view. I was thinking of the tremendous stack in the New York Public Library, which for many years was the largest single stack anywhere, and it was so simple that almost all of the communication was through the wide center aisle. It was 300 feet long and 80 feet wide, and not too long and not too wide. On the other hand, I have seen the plans recently for the Army Medical Library, where they have sixteen main aisles. In a thing so large I should think you would get completely lost and never find your way out. If you are going to have a page on each level, you want the level large enough so that the page will keep reasonably busy. If you have sixteen levels you certainly are not going to have a page on each one sixteen hours of the day. It seems to me that the tower stacks have been carried too far."

MR. O'CONNOR: "Since that question was raised in Mr. Metcalf's memorandum, I have tried to find some way to figure even approximately what might be the break-even point on it. I don't feel that it has an awful lot of validity, but starting with the code requirement in New York that your stairs be approximately at a distance that provides not more than 100 feet of travel horizontally in order to reach a fire exit, I assume that if you spaced your stairs in that way you might consider that a very efficient stack was based on the principle of a 200-foot square. This would provide you somewhere between 500,000 and 600,000 volumes on the basis on which the Princeton stacks were figured. Consequently, if you were going to take two of those 200 foot square units instead of one your average length of run horizontally would be approximately 100 feet.

"Actually, you can go about a foot a second going up and down stairs normally, and you can do four or four and a half feet horizontally, three miles an hour. Theoretically, you would be able to go horizontally about 50 feet walking or one normal floor on floor height.

"On the other hand, you have not only to take the pedestrian walking; you also have to take into consideration the very important question of shelving and getting books. The moment you start to use a stack lift or elevator, you have the problem of loading a truck and getting it on to the elevator; in fact, of calling the elevator, which probably is somewhere else.

"So, I think it is not unreasonable to assume that it might be double that. That is where I arrived at the theoretical figure of 100 feet horizontally being worth a story in height. In the Annex to the

Library of Congress they have about 850,000 volumes per level. They have 10,000,000 in twelve levels. That is an area of approximately 150' x 300' on a floor. Mr. Barnes said he felt that that was not unreasonable. He admitted that there was a point beyond which you definitely ought to go vertically rather than horizontally, even leaving aside the question of available land. That gives you a run of anywhere from 500,000 or 600,000 up to perhaps 800,000 or 900,000, and I should guess that somewhere in that range might be a reasonable limit.

"We are figuring about 650,000 for now but when we have the addition, we will have much more than that. The theory was adopted that we would double this area. We would get, presumably, roughly 1,250,000."

Mr. Metcalf was questioned regarding Harvard Plans to extend their stacks horizontally under the Harvard yard.

MR. METCALF: "The larger the stretch, the larger area on any one level, the wider your main aisles should probably be. It will help to use bigger trucks in shifting books from one place to another. One of the great things about the New York Public Library stack is that a four-foot book truck can be used in it perfectly comfortably. It carries twice as many books as the truck that we use."

MR. O'CONNOR: "If you get to that dimension horizontally, it might be worth using electric trucks. Many people seem to feel these are normally not desirable. They are used between the old and new Library of Congress, but largely due to the fact that there is a rather serious grade condition underground."

Conveyors were then discussed, and the problem of getting books to the conveyor, as well as the location of the circulation desk relative to the stack.

MR. O'CONNOR: "I agree that it is desirable to have your main desk as near the center of the vertical rise as you can, other things being equal. I still think that your average time of shelving or getting a book would be less on the average with more books on the horizontal, up to something around a million volumes."

MR. METCALF then brought up the point that if using an elevator, five stories can be traversed almost as easily as two stories. Going by foot is a different matter.

MR. RUSH: "There are a lot of administrative problems that haven't been mentioned about the sixteen-floor tower. At Yale, with sixteen floors, it was necessary to employ one man doing nothing whatever except closing windows. There it takes one man four and a half hours to close all the windows around the tower."

MR. ELLSWORTH: "Since we saw the Princeton plans last, you have in effect abandoned the idea of a single all-inclusive stack area, and you have split it up as we have at Iowa; you have split it up by

putting departmental areas on each level. I think that is sound. I believe you said the faculty felt you should put those areas down there. You are satisfied with that? You would prefer to have them lined up with the relevant books rather than to have air-tight stacks and departmental areas somewhere else?"

CHAIRMAN BOYD answered affirmatively to both questions, and Mr. Ellsworth then asked for comment from the group.

CHAIRMAN BOYD: "What we have come to now I think really expresses the philosophy of the building at Princeton very well, or at least as well as it could be expressed. That philosophy, as you know, is the idea of bringing together in a close, harmonious, and flexible arrangement, the books and the members of the faculty and the students. You can get that by a vertical adjacency, but there was something a little bit artificial about it or something psychologically disadvantageous. With the departmental areas all in the superstructure and the books all in one box below, I think one of two things would have happened. The departments would have gone down into the stack to work, making your superstructure meaningless to a large extent, or they would have begun to bring up in fairly large quantities the books that they wanted at hand, thereby breaking up your classification, causing a more or less horizontal relationship in an unsystematic way. I think this really gives you the juxtaposition that you want in the normal and systematic manner. That is my feeling about it, and I am very much satisfied with it."

In reply to questions, Chairman Boyd admitted the Central Desk would not know the location of books, with departmental groups pulling material directly from the stack all the time. He stated they would have to patrol the rooms every day and perhaps every hour. He planned to use some charging system similar to that used in the Harvard stacks, where the user fills out a double perforated card, one part of which is picked up by a library page.

MR. METCALF: "Going back to the question of how many levels to have to take care of 2,000,000 volumes, isn't it true that the fact that you are bringing so many more people into the stack makes it advisable to have fewer levels? You don't want the public to have to go up and down sixteen floors, and you don't want to provide elevator service for everybody who comes in and out. Therefore, the fewer levels you have, the better it is. I think that is the biggest argument in favor of your spreading out as you are doing."

MR. O'CONNOR: "I think there is another argument. With the completely unpredictable rate of growth of different classifications of books, you are much more likely on the average to grow per floor uniformly if the floor is big enough to average the rates of growth in a number of different classifications."

MR. METCALF: "That is true, although the cost of shifting books from one level to another over a term of years is not tremendous."

CHAIRMAN BOYD: "We should not exaggerate the importance of having the history classification next to history, because history includes so many things like bibliography that are used by other departments and vice versa. The departments want to get the major part of their books. As nearly as possible we have tried to get the major classifications opposite the departments."

MR. METCALF: "The thing that worries me most about the general philosophy of the situation is the fact that it is pretty complicated for the undergraduates. We are planning on an undergraduate library at Harvard so as to simplify the situation for the undergraduate. With your present collection of 1,000,000 volumes, perhaps you can take care of the undergraduate, but you are looking forward to 2,000,000 within a period of years, and 4,000,000 in due course, and I am not at all sure that the average freshman or sophomore, to say nothing of junior or senior, needs to be exposed to that many books. You may want to shift to a simpler situation for the undergraduates but, of course, you can expand in that direction."

CHAIRMAN BOYD agreed in the need for simplification for the undergraduate. "You are stating now the philosophy -- or the rationalization -- of the vertical plan: the small superstructure with departmental area, but with book storage capacity of 50,000 or 75,000 volumes per floor, which would be your undergraduate teaching library; and then down below would be your main reservoir of books. That, I think, tried to express in one building the dual college-university function that you are expressing in two buildings."

MR. METCALF: "In two buildings, but we could do it in one if we preferred to do it in one."

CHAIRMAN BOYD: "Exactly. I liked that idea very much indeed. I found that we tried that once in Chancellor Green, the older part of the building to the north. We had there a reference room and a selected undergraduate library, with Pyne representing the main repository. That was twenty years ago. It didn't work, nobody liked it, and we did away with it.

"The faculty seemed to think, as a general consensus, that the bookstack ought to be kept intact as far as possible, and that the main classifications ought not to be dispersed in any way -- or at least that we ought to keep the dispersal at a minimum because there are all sorts of things operating to violate classifications every day -- the oversize books, the rare books, the ones you pull out of the main stack, the special collections, and so on. All those things militate against a uniform arrangement of classifications."

DR. DAVID: "It was in response to faculty opinion that you have moved these dispersing agencies right into the central classification, so they will be torn apart daily and hourly and continually."

MR. O'CONNOR: "There is one thing that has developed from the recent studies of the building which makes it possible, without giving

up the outside light and air on the upper floors, to have a selected group of books and to close the lower stacks entirely. One of the early reasons for the modular form of construction was the desire to have pretty complete flexibility as to whether we built more stacks or more superstructure. If it were found desirable to close the main stacks below the first floor level we could extend these wings as superstructure and get the additional departmental area. This would make the lower part of the building entirely stack."

MR. O'CONNOR discussed problems connected with the selection of floor material. Asphalt tile as a finishing material was being considered. "The large rooms entail the problem of fairly big spans, 50 feet, which will be handled either with trussing or with large girders across. The height of those columns will give very considerable bending movement which did not exist when they were braced every 9 feet or so. We have a good many problems of that kind which should be run down. We are very anxious to get Snead & Company together with us and our structural engineers to check the procedure for adapting this standard system to our particular problems, and then immediately to get the relationship of cost. Fortunately, the University decided to employ a builder early in the stages of the design, because (particularly in the present market) it is only the builder -- and it should be the builder who is actually going to build it -- who can give you the best information on that point."

MR. O'CONNOR: (In reply to a query) "The manuscript room and the so-called treasure room are designed with a private stairway going down to the top stack level. This will probably include a preparation room for those particular items and also stack expansion as needed."

CHAIRMAN BOYD: "We made a rough calculation in 1940 of the additional cost of maintenance and staff entailed in the new building, and we capitalized that additional cost at about $1,500,000. That will give you roughly the budget that will have to be taken into account for the additional staff. I think that this building will operate on a very slight increase. The increase will certainly not be proportionate to the increase in size of the building."

There was discussion, serious and otherwise, on Dr. Vannevar Bush's theories printed in the July Atlantic Monthly, regarding the storing of knowledge (1,000,000 volumes in the compass of one desk). Chairman Boyd stated that "whatever we plan this building for now, it ought to be adaptable to something else in the future. I am very much interested in the ideas suggested by Mr. Bush, but I take human nature a whole lot more seriously, and I don't think we are going to change human nature that much. If we had Dr. Bush's equipment, we might put the Princeton University library in every dormitory room, but I think that is a long way in the future."

MR. BURCHARD: "It is probably practicable now, and certainly will be within a decade, to have durable micro materials plus a selective system whereby you can set the proper number of levers and, if the little slots have been cut in the right places in the cards, you can shower down

all the knowledge there is in the collection on button shoes in the first decade of the French Empire, or something else. The mechanics are here now, if we want to pay for it, and surely it could be made very quickly available. Unfortunately, somebody has to put the slots on these cards, and that is where the whole thing breaks down until we get better and several hundred times better bibliographies and abstracts than we now have, and until scholars will take enough trouble with their own papers to write them in a mutually usable and easily referenced form, and until there is some correlation of all these things we all know about.

"We might get to this, but I am not even sure that it is desirable. Supposing that it is desirable, it seems clear that the building will be entirely different, that you will have a lot of machinery; you will have all kinds of processing, and you will become an entirely different sort of outfit. You may have projection booths all around. I don't see how you could plan a building sufficiently flexible to take care of that. If your building is out of date in fifty years, that is fine because no building should be in date that long. I just don't think you can possibly predict what is going to happen. I don't think we can plan for it yet."

MR. HOWE: "I have a question which involves the whole philosophy of modern architecture. Should you really distort your building, which is actually a workshop (almost all buildings now are workshops), into a strange Gothic shape just because somebody at Princeton has a prejudice in favor of it? I consider it quite undesirable to have stacks or anything else underground. Underground space is horrid. Then, if you want to transform it to something else, you have a building that is usable and that has not been pushed out of all resemblance to a workshop. You can have attached a little financial beauty for the boys who contribute the money for memorial rooms. Furthermore, I don't feel so comfortable about water in building underground storage. I have had a lot of trouble with water in the past. I am not suggesting that anything should be changed here, and I think yours is an excellent solution; but we should all consider this problem of useful architecture, which now is almost all architecture."

(Meeting adjourned at 5:00 p.m.)

FRIDAY EVENING SESSION, OCTOBER 26.

The evening session was called to order by the chairman with a request to pursue the subjects of air conditioning, illumination, and ceiling heights.

MR. HOWE: "I hear that there are extraordinary developments in materials which will absorb moisture out of the air at a rate much higher than silica gel. Have there been any new developments in that line?"

MR. LEOPOLD: "No. There have been developments of other materials, such as activated alumina for the purpose. The backing of silica gel, as far as the units to handle it, has been rather poor. It still is probably a better material. The liquid absorbents are lithium chloride, calcium chloride, bromide salts, and similar salts. I am not so sure that they are as good as their backing. They are being applied in fields in which they do not belong. I think probably the best application of the dehydrating agents is in a location where central cooling can be taken care of by well water. If you try to put it in a system where you dry by separate means and then cool by refrigeration, it is usually a more expensive end result than to use refrigeration for the whole job.

"It looks ridiculous on a hot summer day carefully to cool your air down to 55 degrees, then carefully warm it up to 60 or 65, but that is the only way that you can keep a room dry if there is no internal heat load. The companies that sell these dehydrating agents play on that idea and say, "Let's do it separately," which is perfectly all right. It works. But actually it costs you a great deal more than to do it the other way. One reason is that the refrigerating machine removes about four times as much heat as the equivalent energy you put in in power. In other words, for each horsepower you put into an air conditioner compressor, you remove nearly four horsepower of heat from the room, which looks like an efficiency of 400 per cent, but isn't. The dehydrating agent efficiency as a heat remover is between 30 and 50 per cent. So, you have this enormous gap to close, and that is why I say that usually if you need both means, then it is cheaper to use just one."

The discussion turned to lighting and Mr. Leopold corrected his previous estimate of the lighting efficiency in the meeting room. It had measured 21% efficiency instead of 26% estimated. Questioned about the cause of inefficiency, Mr. Leopold stated, "I think it is due to the mutual shadowing of the tubes and absorption. Perhaps the paint on the reflectors and grids is not properly selected."

MR. HOWE: "There are efforts now being directed toward producing an alumina ceiling with indirect light, but they are both equally inefficient. I wonder whether we should not just abandon this idea that we can reduce everything to modern squares and rectangles and accept the fact that fixtures have to appear in the room still until we find a better solution."

MR. LEOPOLD: "I think that the over-all economic result dictates that in many cases. Some of the trough fixtures, though, are reasonably efficient -- fluorescent included. Some of them are not as low in efficiency as this unit. I suspected they were low because of the relation of the depth of the tube to the width of the fixture. A wider distribution would be better; a spread of the tubes so that they don't shadow each other as completely.

"I suggest you use an ordinary two-tube fixture as a direct approach and recess it so that you have four instead of twelve in the bay, 30 or 40 watt tubes. If you were getting any glare from that fixture, you could drop it below the ceiling a little bit. I should like to see it project enough below the ceiling to project a little light back on the ceiling."

MR. WALKER: "What we are all trying to do is to get rid of the fixture in the room, if we can, and get the space, so that we don't have this secondary ceiling of lighting fixtures."

MR. LEOPOLD: "In a utility space of this type it would be quite within reason to extend a fin down a few inches. A coffer light on a big ceiling is much helped by a beam breaking it up. You don't want to look down the room at a sea of little white circles."

MR. BURCHARD: "Perhaps we are making a mistake trying to get this kind of universal uniform lighting everywhere in the building. I suspect that illuminating engineers don't know whether or not 25 lumens or any other number is the right quantity for every individual. I believe that an adjustable light in the carrel, an old fashioned light in a great many types, may have a great deal of merit."

MR. LEOPOLD: "When your eyes get old, you need 50 or 100-foot candles. The only way to do it is to have an individual light. This does not apply, of course, to large reading rooms. Usually you have plenty of opportunity to get the light down from those ceilings."

One of the justifications for a high ceiling is the simplification of the problems of air conditioning and getting your light down.

Then turning to "cubage," Mr. Leopold asked for information on costs per square foot. "If you start to design a room for a given purpose with a 10-foot ceiling and then increase it to a 15-foot ceiling, you are not increasing the cost 50 per cent even though you are increasing the cubage 50 per cent. Just about how much are you increasing that cost?"

MR. MACDONALD: "There is usually a limit to the height you can make a building, either by law or by the number of steps you are prepared to climb, or something like that. If you have such a limit, to put in more height than is absolutely necessary is going to increase the over-all cost of the building very much."

Discussion turned to the need for elevators when the building reached a height over five stories, and it was stated that practically no library is dependent on elevators.

MR. WALKER: "There is one which evidently thinks itself a very successful library which is wholly dependent on elevator service to take care of every one of its needs. I think this idea of height has been hurt in our minds by the fact that we have tied up elevators to so-called engineering building economies or economics, and they don't exist that way. An elevator is as much a comfort factor as a water closet or a stairway or a light. In a building of four or five stories they cost only around $12,000 apiece. They are not an expensive item. Actually, if you wanted to over-elevate a building, your capital cost would be very slight; they are perfectly safe, push-button operated by the user.

"We try to sell to our clients that we put elevators where we need them, without any relationship to peak loads or the necessity of carrying people, but wholly for the accommodation of going from floor to floor; in other words, so as to make it easy. We built the G.E. Laboratories, designed on the basis of walk-up. We spent a lot of time finding good stairways to walk up. We are now putting elevators in all over the place so as to get that feeling of accommodation.

"We put elevators out into the open where they are seen. We put in two at a time so that you can have one going up and one coming down. I think if you looked at this question going through a building from the standpoint of elevator operations, you might change your concept of the library. A three-story building or at least any over three stories should have as many elevators as you need to get people up and down."

MR. SEELYE: "I made a study at one time which indicated that the extra cubic cost was about 25 per cent to raise it a story in height. If your cubic cost was 50 cents for a nine-story building or ten-story building, it would cost you 10 cents to make it an eleven-story building."

MR. FISH: "I have never met a general contractor who did not, after making a detailed estimate of cost, fail to have somebody run over the cubage of the building, and if the stories were rather high and it made the cubic foot cost look a little cheap, he would say, "We are selling this building too cheap," and they would add something. They do charge something for extra cubic feet, even if it doesn't add much to the construction cost."

The discussion turned to lighting for rooms with twenty feet or more ceiling height. Mr. Leopold stated that it could be some sort of ornamental fixture let down from the ceiling.

MR. AMBROSE: "When you get up to the point of 9 or 10 feet, then, the ease with which you can light and ventilate and air condition is not appreciably changed from 10 feet on up to 15. Is that so?"

MR. LEOPOLD: "For a small room, no; for a large room, yes, a wide room. If you have a ceiling height of about 15 feet, you can really blow across the room and put large quantities of air in from one location; whereas if your ceiling is low, you must run air distribution out in smaller outlets. When you get down around 7 feet, you are in trouble."

MR. ELLSWORTH: "How does it happen that all these libraries with big reading rooms are so badly lighted?"

MR. WALKER: "It probably has been maintenance. They started off with a 100-watt lamp, and they have been changed down to 50 because the electric light costs have been going up. Where ventilation has been designed to do a job, the maintenance crew have turned it down to 50 per cent efficiency."

MR. HOWE: "The old-fashioned ones. Now it is probably cheaper to leave the lights on all the time, twenty-four hours a day, and never turn them off. Furthermore, have no switches. Just leave the lights burning all the time. Have them turned on from the center and forget about them."

CHAIRMAN BOYD: "Leaving aside esthetics and the Memorial nature of large reading rooms - this question is directed to the librarians - is there any library function that demands a height greater than about 14 feet? By library function, I mean reading, processing, and delivering books, and so on."

No librarian produced a function requiring a high ceiling and discussion turned to the perforated ceiling in the Snead mock-up. Was there any way to ensure air working down through all the holes, either by reducing the size of the holes or the number of panels having holes?

MR. LEOPOLD: "When you reduce the size of the holes and the number to the amount you need for sound absorption, you still have a chance of this uneven distribution because the number of holes you have left is so much more than you need for air. If you start at the wall and just blow across that for 23 feet, you would have this problem. One way that you can correct that is to run a very simple duct out, with side outlets on it, and distribute it across that panel. That will probably be necessary in some cases. Complete uniformity of distribution isn't required. The principal objections to uneven distribution are the cleaning problem, and in the extreme, a possible cold air spillage. That could be serious, but it is not anything to worry about because it is too easy to correct. We can easily take care of the air conditioning problems raised by the module system. I have done it on a floor 55 feet wide, so I wouldn't worry about a 23-foot span."

DR. DAVID then brought up the size of the 18 inch hollow columns, which might be inadequate, spaced 23' apart, in a high building.

MR. LEOPOLD: "You would gain very rapidly as you increased the size of the column. Further than that, as Mr. Macdonald suggested,

you could use every column for supply, instead of alternate columns for supply, and put in a less regular return system. That is also possible."

It was also brought out that you could build something on the module principle without hollow columns. This means false beams or air ducts below the ceiling.

CHAIRMAN BOYD: (Summarizing) "You can control the air conditioning in this module up to, say, a height of five stories, and the width of the building makes no difference. Is that correct?"

MR. LEOPOLD: "That is correct. The width of the building makes no difference. I wouldn't want to tell you, on a 23-foot square module, how far you can go. You can go six stories with ease on the module that is actually erected; six with ease with it all in the columns; that is, with supply and exhaust both taken care of in columns."

MR. BURCHARD: "When a leading university, which should influence thought and does in many cases, takes a position which is a little unusual about a building, it would follow that the casual thinker would think that there must be some rational reason for that and he would naturally like to explore the rational reason.

"I have listened today with some effort to determine the rational reason which placed your stacks underground, so I could go back and tell M.I.T. why we should put membrane water-proofing around the basin and do the same thing, because we also don't want a high stack."

MR. HOWE: "Is there any objection to having books underground? Of course there are lots of objections, but the fact is that the objections are much less important than the fact that they are being forced on the architects by people who have some strange, fantastic notion of traditional monumentality.

"It has always seemed to me perfectly absurd that the lives of the people within should be sacrificed to the external appearance of a building. I built houses for these wonderful people in Philadelphia, who didn't care at all about ducks, geese, pigeons, and cows, but who always insisted on having pigeon towers and all those things, which puzzled me very much. I suddenly said to myself, 'Let's give this up. Let us see what the people need to live in.'

"I don't give a damn whether a room is high or low from the point of view of whether it is economical or costly. The only thing that I care about is whether it is a good room for those people to live in and work in. I think if all of us who really have some influence in the world would maintain that point of view, we would not be downed by this financial sheet which we are always presented, saying, 'This is the money that you have, and you have to produce so many cubic feet, and nobody gives a damn what happens to the people inside the building.'

"I just ask you gentlemen that we all take up this same point of view, that we all fight for the same cause, and that we do not longer

argue about the petty esthetics of modern architecture, which after all are only an answer to the needs of the American people. You find the right answer to the lives of the people in the building, and you will get a beautiful proportion."

There was then considerable controversy about reading and working in underground stacks, and stacks lighted by windows on only one side. Mr. Howe stated that he didn't want to go underground to read a book, and the attitude of the books was discussed. Mr. Howe felt it was more than the matter of light, a matter of man's destiny being above ground, not below.

MR. ELLSWORTH: "Mr. Howe, a little while ago somebody asked where you would go to read a book. Where do you go when you want to read a book? You don't go to church. You go to bed, I'll bet. When you read your most favorite book, you go to bed. So do I. Next, I go to my living room."

MR. WALKER: "Do you go to a comfortable chair when you are working on a book, or do you sit at some place where the book can be rested and where you can write at the same time? We ought to divide the users up into categories of use, so that we know what we are doing. The first person to whom you in the university or college are trying to introduce the book is the boy who has come from school. It seems to me that that boy is a special problem. When you get to tending the wants of scholars, then you have another set of problems. That is what I think about the Princeton plan. It seems to me that to require this boy to whom you want to introduce the books to go wandering down and around that stack to find his way to some place is putting obstacles in the way of his loving books. It seems to me that you are taking him into too large a mouthful."

CHAIRMAN BOYD: "I should like to talk about those stacks. I think our departure from the traditional browsing room is a very good one. A browsing room implies, first of all, a selection by somebody else for the man. Secondly, it implies a self-conscious direction to go and read. Even the freshman gets useful stimulus, I think, from wandering through an endless mass of books and bumping up against things that he never heard of. Throughout the stack we hope to put in these alcoves in the open reading spaces, and so on, the things that librarians usually hide -- the Mercator maps, the Hogarth prints, the things that are never seen except in specialized collections and are asked for only by people who know what to ask for. We want the freshman to bump up against things that he never heard of before. He can do that in the midst of a million volumes and maybe get something. He will certainly get something beyond a few textbooks and a few survey courses in civilization from Adam to Coolidge.

"In addition to that, we have in the library a large number of specialized rooms. We have, for example, the Parrish collection of Victorian novels, one of the greatest collections of its sort in the world. That will be a reproduction of a gentleman's library, Mr. Parrish's

library over at Dormer House. The freshman who borrows a book at the reserve desk can go in and sit down in one of Mr. Parrish's chairs and maybe find out something about Charles Reade, and so on, just by looking at the backs of books and getting curious. He can go in the Rollins collection of Western Americana. He can go into the treasure room. In other words, the things that traditionally have been regarded as closed areas of use are now wide open. They will be in locked cases. The mere setting will make him ask questions. If he has any sense at all, he will ask questions; he will want to know what it is that is worth that much attention."

DR. DAVID: "Going back to the question of basement stacks, I don't think that they will seem distant and inaccessible and unattractive to your undergraduates if they are properly air-conditioned and properly lighted and comfortably furnished. I think I can't follow Mr. Howe in his determination to live above ground. I think that that is a kind of emotional reaction that resides with him or his generation and represents a certain traditionalism of the very sort that he is protesting against tonight."

MR. HOWE: "I would be quite willing to accept that, because I don't really want the library book to satisfy me. I am just stating my opinion as a man who has an opinion, and lots of other people have. If they disagree with me, I say, 'Why, surely, if you want that, have it.' I was only defending the thesis that we must consider the people who live in the place, and not the people who walk by on Nassau Street looking at it."

MR. BURCHARD: "I have a strong suspicion that those people who come to your universities prepared to read books, and to be interested in books, got their interest in the first browsing room they were ever exposed to, which was father's library, a browsing room selected by one man. I dare say if we should list 10,000 lovely titles here, we would find that none of the most literate people in the room had read 3000 of them or had even looked into 3000 of them. We know them and recognize them, but we haven't read them. Even in the most limited browsing room you could select, riches would be offered to all of us."

CHAIRMAN BOYD: "We have that kind of selection throughout the building; we also think of the complete library that is a browsing institution. These conference rooms in the stacks will be devoted to interdepartmental exchanges. For example, history, economics, and politics will be in a room 25' x 56'. It will be in the nature of a gentleman's library, with bookshelves around the wall, with the standard works on economics, politics, and history -- Adam Smith, Macaulay, Gibbon, and so on -- the books that we all have given to us as duplicates. They will be there for the boys to bump into and read generally. That really is, in a sense, a browsing room."

DR. DAVID: "Coming back to Mr. Walker's point, I love vistas and beautiful settings, but when it comes to study in the library what I am interested in is the vistas of the mind that are seen in books. What

I want is a comfortable, suitable workshop in which to open a book and look for those vistas which are intellectual rather than physical, out the window."

MR. WALKER: "I think very definitely the people who lived around this area (Virginia) and who helped found our country had somewhat a sense of the vista in books, the vista of looking out over these hills, and the vista of relating their lives to their surroundings -- the fine houses they built for themselves, the fine libraries that they collected, the inventiveness of a good many of the lives around this area. It is simply amazing. It seems to me that with this relationship goes a desire to produce in every university probably more leaders than the university is producing. I mean leaders in life. One of the things that we are trying to do, it seems to me, is to pinch them down all the time, to pinch them into smaller spaces, into smaller cubicles of physical things, into more masses, getting rid of that free man that we want to have. I don't think that you can be free men with six or seven inches of space above your head. I think you have to have a little more space than that. You know what solitary is. Solitary is a six-foot cube in which a single light is burning. You just can't get down to anything more compact than that."

MR. ELLSWORTH: "Judging from what I know of what teachers say and think about libraries, we are talking on a plane very different from what they are thinking. The professor feels that, although there is value in, let us say, chaos in his materials, he can hardly afford that at the beginning stages, and he selects for his students the facts that, in his reasoned judgment, are most relevant to the beginning student. He makes his presentation on that basis at first.

"I think there is an analogy between that and the materials that we present for him. The professors that I know would be appalled at the idea of allowing the freshmen quite so much anarchy as stack access. They believe there should be a more organized collection of ideas and symbols for the first year student. I believe the further the student goes, the more the faculty want him exposed to the rough stuff so that he can develop his own initiative. However, they start him out the other way."

MR. CAMERON: "The vast portion of people who go to universities, go there for four years after they are eighteen years of age. However young and immature they may seem to you, it is the last crack we are going to get at them. If you continue to spoon-feed them and select for them constantly (which, by the way, you already do in your reserve collection), I don't think you are going to give them much chance to mature. I think that is one advantage of putting them, not into a million books over-all, but on to a floor of books, a separate area in the stack. I think that is the time to do it, and the sooner the better."

The question was raised whether Harvard with four million books gave freshmen a greater opportunity than Princeton with one million. Mr. Cameron thought so, provided Harvard built up a brand-new library. Mr. Metcalf then said that Harvard didn't do nearly as well for undergraduates as Amherst or Williams with 100,000 volumes.

DR. DAVID: "To me this question is a little bit geographical. I think there is a difference between the general run of freshmen that come up in Iowa and Indiana, let's say, and the kind of selected freshmen that come up in a place like Bryn Mawr or Princeton or Harvard. I think there is even a difference between the freshmen who come to a place like the University of Pennsylvania and the freshmen who come up to a place like Princeton and Harvard. Yet we have them for four years, and by the rough and ready exposure method, if they are any good, they can learn a very great deal from a great collection of books and without spoon-feeding in the course of four years.

"Broadly speaking, I think I do rather disagree with Ralph Ellsworth. I feel that if I can create a situation in which they, even the kind of freshmen we have at Pennsylvania, are introduced to a larger collection, it seems to me to be more nearly right."

CHAIRMAN BOYD: "I should like to support that. Amherst doesn't do a better job than Harvard merely because it has 100,000 books and Harvard has 4,000,000. There are a lot of other factors. One of the things that I think we ought to face in this business of organizing ideas and organizing knowledge is the failure to train the freshman to use the library and to use it properly. He goes through in a hit-or-miss fashion, and he learns to use the Harvard library because he knows that in the south stacks on the second floor, second tier, he can find American history. Put him in the New York Public Library, and he is lost. We don't train them to use the tools so as to be able to use any library anywhere. I think that is a shameful lack in American education."

MR. BURCHARD: "I am just beginning to get a little worried about it in my own institution. Any man who comes to M.I.T. immediately goes across the street and buys a slide rule. That is his class pin. This slide rule is surely as formidable as the card catalogue, but it is a different tool and he has an entertaining lecturer who teaches him how to use it. He knows he is going to use it, he does use it, and they all learn it. I suppose a good many M.I.T. graduates stop using the slide rule in time. But this business of using the full reference tools of the library is obviously a device for the scholar and is of no importance to a leader who is never going to have time to be a scholar. We must bring these tools in terribly hard and make them a little bit better looking with paint, which is about all we can do for them. At any rate, stress them."

CHAIRMAN BOYD: "Of course, we are not trying to turn out research scholars in every case. We aren't trying to make little reference librarians out of every freshman."

MR. METCALF: "At Harvard, most of the boys live in the Houses, where they have a completely open-shelf gentleman's library of 10,000 volumes under the same roof with them. Fifty per cent of the boys will probably never make any use of anything more than that. A good many of them may be the leaders that Mr. Burchard was talking about. But the 50 per cent that we are most interested in need something more than that,

and we hope we are going to have an undergraduate library for them, again completely open-shelf, but with 50,000 or 75,000 titles, which they can get at very easily and much more easily than they can get at 1,000,000 volumes. But there are going to be 2 or 3 per cent of the freshmen, 5 or 10 per cent of the sophomores, and 15 or 20 per cent of the juniors and more seniors who will need to go to the 2,000,000-volume Widener collection, and we are going to make it possible for them to go when they are freshmen, sophomores, juniors, and seniors, when they are ready for it. We will push that way when the opportunity comes. I think it will be a real advantage to have the three types."

MR. HANCHER: "We recognize in the professional schools that the man who enters on a professional career must pursue it all through his life. If he is a doctor, a lawyer, an architect, an engineer, or any other, he must keep pace with the developments in his field. If I understand professional education at all, one of the essential things that the professional faculties aim to do is to train the young men how to do that, what the sources of materials are, how to find them, how to gain access to them, and how to have some judgment as to what they are worth when he does find them. It seems to me we have completely neglected that in the liberal arts. It is astonishing that a good many of our people, once they get a degree, never learn anything more, because we haven't taught them how. We haven't taught them how to use these materials; we haven't taught them how to go into the library and find the things that are relevant to the issues of the day in which they might conceivably be interested. Too often they are not, but they might conceivably get stimulated to know something about the atomic bomb, and the only way they could do that would be to buy a book at the bookstore. They couldn't go to a library because they don't know how to use the library. I think there is a great deal of merit in the idea of teaching these people how to gain access to sources of materials.

"The medical schools know that all they can do at the very best is to give a man a basis for further knowledge. They can't teach a man how to be a doctor all his life. Being a lawyer, I can speak very definitely on this point: Any man who attempted to practice law on the basis of the law he learned in law school would get his client and himself in trouble very quickly. The points that come up in practice are much more abstruse and difficult, usually, than the ones he has been taught in the law school. The law school has aimed to give him the fundamentals so that he will know in what direction the client's problem points, at least, and will know how to get there by his own researches, but he will have to do a tremendous amount of research.

"We have assumed that that is all right in the professions, but we haven't done it in the non-professional field. I think it is important to introduce these young people to the library, to get them to know something about books and the means of using them, and to pursue fields of study and perhaps to develop a little more entertaining amateurs than we know so far."

MR. LEOPOLD: "Referring back to a question asked earlier about the adequacy of the 18' x 18' stack, I want to make one qualifica-

tion. I was speaking there in terms of the type of room we were in. If there were stack floors mixed up in that pile, I would say that you probably would get two or three stack floors for the air quantity that you would need for that one floor that we were on, capable of being changed but definitely assigned to stacks for the time being. Then you could have more floors. In other words, in a building like that, you might assume a reasonable diversity in the use of those floors and add one or two more floors to the figures I gave."

MR. LEOPOLD further stated that a stack carrell would not need a special air outlet, provided the door had a grille in it. Mr. Metcalf then said he did not want doors. Princeton voted for doors with locks in order to fix responsibility for what went on inside.

CHAIRMAN BOYD: "We are planning the arrangement in bays, ten to a bay, so that we can close off both ends of the bay, or close one end and have a window at the other end, and put the people who use typewriters in a compartment all to themselves."

MR. MACDONALD: "I should like to go back to the subject of the reserve book room. I know little about libraries, but it has been my impression that that is the best way in the world to estrange the average student from learning the real use of a library and loving books."

One librarian ascribed the reserve book to ancient tradition, and hard to break. Another stated he didn't have them. A third blamed it on professorial laziness.

MR. RANDALL: "It is a lot easier to pick the books out, so that we know what the students are going to read, than it is to take the trouble to get a collection of books together which are good, of reasonable size, so that the student can go in and read and select what he wants to read. It is a lot easier to give examinations if we know what texts they have read. If you haven't a library large enough to handle a large group in one course, you had better tell your students, 'We are sorry, we can't give you adequate library facilities, so we will give you a makeshift.' That is what you are doing. You had better admit it. That is what the reserve book room is in a large number of cases. It is a makeshift forced upon the institution because it can't afford to do anything else."

MR. ELLSWORTH: "When I came to Iowa the faculty committee said, 'Now look. A library ought to be honest and do this job. Let's make the library an honest place to help X number of students do their work.' They started out on that assumption. That immediately meant that we had to re-define what we meant by a library. We went ahead and planned this thing so that it would accommodate large numbers of students. We even said that conceivably we might want to put 4000 people in this building at once. We think it isn't necessary to have a separate, little old-fashioned reserve room. Other libraries have handled the reserve function on other bases. The reserve room is not the only answer."

Questioned, Mr. Ellsworth said they had a reserve room at Iowa but would not in the new building. However, they did propose to have a reserve function of some sort.

MR. ELLSWORTH: "That is the point. That is the way you get people to come into your library. They have a problem. We will duplicate, endlessly, if necessary for that purpose. I think we have probably been too loath to duplicate books for undergraduate teaching. We have been too eager to serve the graduate function at the expense of undergraduate teaching. Duplicate titles have nothing to do with how you handle your reserve function. You have so many students in a class and so many pages to be read, and it takes so many books to do that, whether you have them on reserve or not. I don't care whether a student takes a book and reads it for four hours straight on his own or takes the book for four one-hour cracks at it. It takes the same number of books."

MR. METCALF: "I am going to carry this to its logical conclusion. Get a large number of books. If you have 500 in the class, get 500 copies and give one to each student, and then the boys won't have to come to the library at all, and you will save yourself money."

MR. RANDALL: "A library is a mechanism, so you don't have to do that. You have a reservoir of books which are not used all the time by everybody, and that is why you have a library."

DR. DAVID: "I am concerned about this indictment of the reserve book room. I understand it stems from the laziness of the teachers, who have a large collection of books placed before their students and undertake to educate them and then evaluate their education without knowing precisely what they have read. Yet, all that you say seems to carry with it the implication that there must be a lot of duplicates and that the students must be required to read a particular thing."

MR. RANDALL: "I didn't mean to say that. It seems to me that in any subject there is a large list of books any one of which is probably about as good as any other. The difficulty with the reserve book room is that you discourage the student from reading anything but reserve books."

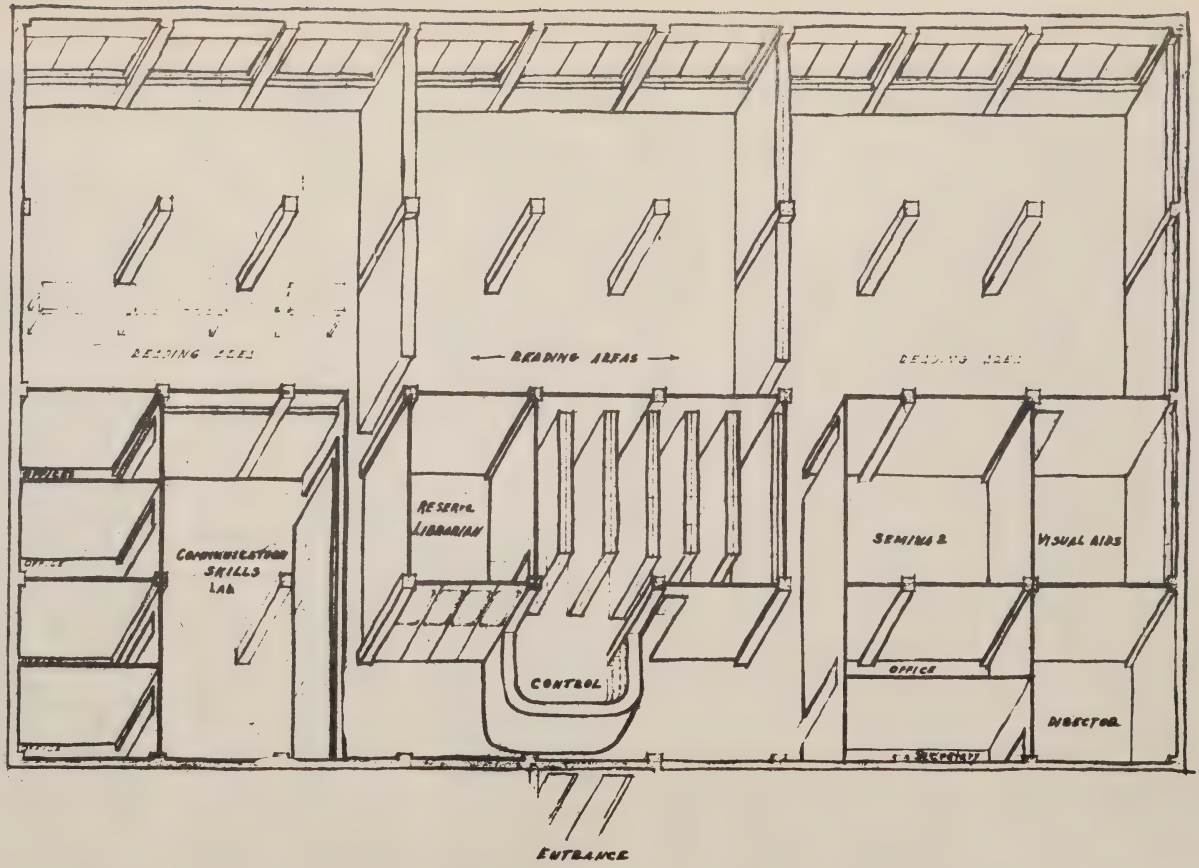
DR. DAVID: "I think your indictment that it stems from the laziness of the teachers broadly speaking is blackmail. I don't think so."

MR. RANDALL: "The reserve book room is the extension of a single text. We had a run here in education about twenty-five years ago when everybody said that textbooks were very bad, and that we should not have textbooks any more. Then we began to put a lot of books together to get a single text out of a number of books rather than to put those things all in one book. That is where the reserve book room came from historically."

CHAIRMAN BOYD: "Doesn't it come down to the question of finance again? To teach a man properly with the proper amount of individual

guidance and supervision costs an awful lot of money, and you save by teaching them en masse. Your large classes are one aspect of that. The reserve book room is another aspect of it. If we had teachers enough and money enough, we could do away with the reserve book rooms."

(Meeting adjourned at 10:20 p.m.)



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SATURDAY MORNING SESSION, OCTOBER 27

JULIAN BOYD opened the morning session by calling for further discussion of the module or unit theory, not in terms of the single module but a building made up entirely on the modular theory. He called on Mr. Ambrose, Business Manager, for Iowa's plans.

MR. AMBROSE: "I think we all realize that this particular (Snead) mock-up that we have here is a rather pleasant solution in a small area, but we all wonder what it is going to be when you stretch it out to dimensions that accommodate 100 or 150 or 200 people at one time. We in Iowa do not have our hands tied by the Gothic tradition, nor are we bothered by donors with ideas of monumentality. We have concluded that we are going to build a factory of learning, and omit from the front area the monument to tradition.

"We worked on this idea of a modular system, trying to compact our building into a workable unit. We need a guinea pig to demonstrate what this final result will be, and we think that on our campus we have the facilities for constructing that guinea pig. At the present time our reserve library is located in an old gymnasium building. The floor space allotted to that activity, as I recall, is 77 feet in one dimension and 124 feet in the other dimension. Applying the particular module that we have here to that area, 13-1/2' x 19-1/2', we will get thirty-six such modules. (Drawings of Iowa's proposed mock-up were distributed.)

"In working at this guinea pig we are not trying to prove anything about the merits or demerits of any type of construction except perhaps an experiment as to light. Our experiment is one with the people who live in the building and the librarianship that is required in operating a building of this type.

"A long area, 39' x 124' will be the reserve library reading room, which will be subdivided by free-standing bookstacks arranged around the walls, tables, and chairs. It will seat over 200 readers. In the center we will house a control desk, with the stacks for the reserve books. The reserve library will bring into this area most of the students on the campus and will expose them somewhat to other books housed around the reading room. Provision is also to be made for a 'communications skills' (composition and public speaking) reading room and offices, classroom, Director's office, possibly a seminar and probably a visual aids room. In these areas we will have the opportunity of using a movable type of partition of some kind, probably demonstrating one or more types of movable partitions that may be used in this connection.

"We feel that this will be a very interesting experiment and an educational feature in preparing our students and our faculty in the use of the new building when it is built. There won't be that tremendous break from an old method of operation to a new method of operation."

Discussion centered on this experimental unit to be set up on a gymnasium floor with a ceiling height of 25 feet. Iowa is considering

use of a ceiling on pulleys with flexible light, ventilation, and similar connections in order to test ceiling heights. It was hoped to have the building set up by February 4 for the new semester.

MR. ELLSWORTH stated they would build toward mixing reserve with open reserve and non-reserve. He hoped that by the time they were ready to move into the new building, this closed reserve would no longer exist, and that the books on the closed reserve would be mixed in general proportion with the books around.

MR. AMBROSE: "This being an old building which will be removed, we hope, as soon as the new building is erected, we are rather free to do as we wish with the outside walls. At the present time we are thinking of either starting it off as a windowless proposition and then opening up some windows or probably putting windows in one side and closing them on the other side, so that we would have that comparison of exterior and interior use of a large area, which would answer many of the problems that we are talking about in connection with the use of basement areas and other areas where you have no opportunity for exterior light."

MR. BURCHARD: "The plan of the final building has really an enormous scale. It is a big thing. The feeling of a person in an area of that scale is quite different from what it is in this room. I think that you fool yourself a little about the scale of your building by the way you have these elements arranged. That is, you enter immediately into an area the scale of which a human being comprehends, and you never confront, I think, one of the problems you will confront in your big building."

MR. WALKER criticised the Iowa plans for the long passages required. Corridor space cannot be skimped. It is an amenity in the use of the building, and easier to clean and maintain if of adequate size. "The Iowa mock-up is so nearly the traditional library plan for a small library that you don't get a sense of the scale."

MR. ELLSWORTH agreed but pointed out that the mock-up must function as a reserve library. There was some discussion of the location in reference to the rest of the campus.

MR. AMBROSE: "It is intended to use the library committee in studying the other possibilities of arrangement and use of this particular area. We will probably leave it set up in this manner for a semester. In the meantime we will develop other ideas as to arrangement. I wouldn't be surprised to see it rearranged quite frequently in order to give us experience in different areas than we now have shown here."

MR. KIRCHHOFF: "As this building becomes a multi-story building and much larger, it becomes a place of public assembly. I think at that time you must control or direct the method of getting in and out of the building with staircase systems and exit systems. I am wondering whether we are then going to have a little difficulty with our flexibility, unless we anticipate several combinations of arrangement."

MR. ELLSWORTH: "We have laid out our large floor area, 300' x 300', on the basis of the plan we think we would like to use, and we have laid it out on the basis of all types of library organization that I have ever heard of and figured our traffic loads. Each of the floors will take 1095 people which means giving a lot of space to corridors and quick access to exits in case of fire."

MR. AMBROSE: "When we talk about flexibility, we don't mean 100 per cent flexibility. We mean flexibility to a large extent within just certain areas. You have at the top a line-up of space that is reader space. Within that large space you have flexibility of rearrangement of equipment to govern the size of the space as you might require it to be governed. The lower part might be a representation of what occurs in other places. You might have a line of classrooms and offices which in one direction is a given dimension. It is not a flexible dimension, so your flexibility is only in one direction. The corridors, the service areas, the stairways and all of that cannot be maintained on a flexible basis. That is a fixed proposition. In the final analysis, flexibility is really a very small item involved."

MR. BURCHARD: "There was some question about the use of this type of space, for instance, for all the things you might want to do in the library. The better this space is designed for the storage of books and the use of books in conventional or present ways, the more nearly it comes to being perfect for that. We have gone through and passed, I hope, the day when we built a room in which hearing was the important thing, and then made it impossible to hear after we had built it. If we were going to have any type of auditorium, I don't think it would be possible to accept a modular room. I think it very much depends on what the building has got to do as to how far this scheme can be projected."

MR. AMBROSE stated that their plans and thinking on flexibility to date came only so far: The entrance with stairways and other usual facilities is fixed; beyond the control desk is a corridor flanked with classrooms or offices which are flexible in only one direction; the reading room area is flexible only in the arrangement of equipment; the stack can be open or concentrated so as to be accessible on each floor to the reading room adjacent to it. "You have this further possibility in flexibility. On each floor level the partition dividing the stack area from the reading area can be in a different location, so that you might have a larger concentration of books on the subjects that this reading room serves, and carry it all the way up. That is what we are talking about in flexibility. It can be used as a concentrated stack area with adjacent reading rooms or with more or less of it or none at all, depending on how you want to operate your library."

MR. KIRCHHOFF then brought up the effect of columns in reading rooms on the circulation of people and the arrangement of furniture. Reading rooms once had columns, but these were taken out to provide flexibility. "Now we don't recognize that flexibility, and we put the column in again, and we destroy the very thing that we thought at one time we had accomplished. What is going to be the influence of the two

free-standing columns in this little rectangle (pointing to the drawing)? I think it will block your movement of students between the two center rows. Is that important or isn't it?"

MR. AMBROSE: "We made quite a few studies of arrangement of the reading area, in determining the economical size module. This module gave us as great capacity either for concentrated storage or for readers as we could get in a unit. It does permit quite a few arrangements of furniture. As you multiply the units, you have a little more freedom."

There was some further discussion on the principle of putting columns in reading rooms, including construction cost increases. Opinion was divided on whether the column served the building or hindered use.

MR. WALKER: "Is the column a service to you or does it get in the way and you become a servant to it? In making a study of this type you ought to have at least one experiment with the column out, so that you have some sense of comparison in one of these rooms against the other. The cost of construction is the least important factor."

MR. KIRCHHOFF suggested an area of the mock-up be used without columns for a period, and then columns be placed in it. Mr. Macdonald stated that the arguments against columns had led them to recommend modules much larger than the 13'6" x 19'6" of the room in which the meeting was being held. Dr. David asked whether it could be increased a great deal above the 23' x 23' being recommended without complicating ventilation.

MR. MACDONALD: "You can go up into greater dimensions - up to 30 feet in one direction without much trouble. The question of taking care of the air conditioning is a matter of the size of the column and also a little more paper work. I think the fewer the columns, the more flexibility you are going to have, without any question whatever; and whether you have the column 18 inches square or 2 feet square doesn't make a lot of difference. The interior dimension of an 18" column is 17.5" without fireproofing, and I don't think that is really necessary. Exterior fireproofing increases the dimension about 3". In the New York building code it is 1½" with certain kinds of fireproofing. Also, if you cut the corners off the column, it appears very much smaller, without corresponding injury to the air capacity."

MR. ELLSWORTH: "I think that in the central third of the building the columns are no problem at all. They don't waste any space to speak of, and they help you, if anything. The only question is in the outer two-thirds. I haven't found any faculty member who wants to do anything that can't be done in a space that occupies six bays of this size. I am quite content to rest on that and say that even in the most conservative library, even taking this whole thing as a reading room, if you want to call it that, with your stacks locked up somewhere else and your seminars and all those things present or abolished, you would surely divide that space up with some books. No matter what you did with that

space, if you left your columns out, you would still want to divide it up with some bookcases running around in there. Those columns give you an opportunity to use that space broken up various ways. We have got some studies here that show how you could put some circular tables around a few of those columns and have square tables in the areas around the round ones. They would serve all kinds of purposes. I have come to accept those columns as virtues. If I didn't have them, I would want something else in their place."

Discussion centered on the need for wall space to display maps and pin-up material. This brought out new methods of using cartographic material, including the stereoptican.

MR. ELLSWORTH: "In a large reading room the books are around the wall; you can put the books in the middle and the maps and other devices and posters on the wall. You have to do it in one of those two ways. I think we have actually an advantage through this type of construction."

MR. BURCHARD: "We must not be too loose in our thinking that we can increase the module just by enlarging the column. If we increase the column dimension, for instance, by about 25 per cent, from 18" to 25", we will double the duct's cross sectional air capacity. However, we increase the load-carrying capacity by only about 50 per cent, unless we increase the steel enormously. This business of making the column consistently bigger and bigger so that we are finally going to get big areas really isn't good. You have to get something that is a pretty good relation, which I think it is right now."

MR. MACDONALD: "Mr. Fish has made calculations for an eleven-story building, where the columns were 18 inches square and the thickest metal required for it was only 7/16ths of an inch. It is a very economical disposition of the metal. There is more economy in making fewer columns of heavier metal than there is in more columns of lighter metal."

MR. WALKER: "You can double the span and do it by your method as well as you can by any other method. All it means is thickening the floor. The element of cost is minor. The fewer columns you have, the fewer interruptions you will have in the use of your building. Our whole effort has been to get rid of columns."

MR. BURCHARD: "Certainly fewer columns are more efficient, but a combination of ducts plus columns and the desire then to serve a closed-in area in which there must be a duct, requires that you have a duct at sufficient intervals to meet the smallest type of area you want to serve with a single duct. You can't just go on indefinitely. If you want to give up the column as a duct, then you can go to free space; you can have the whole building supported by trusses."

MR. ELLSWORTH: "I have studied the modular dimensions. All up to the 26-foot square will serve any function that I can think of working. From all points of view the 22' x 6' gives the best result, but this dimension works quite well."

MR. MACDONALD: "I believe it is safe to say that the bare structure of columns and floors is considerably less than 10 per cent of the finished cost of the whole building."

When pressed for the size of the module which he would advocate, Mr. Walker said he would go to at least 35' each way. It was agreed that air-conditioning is a requirement often dropped at the critical last minute of awarding the contract, because it is so expensive. Mr. Walker urged that it be made a definite requirement. The old-fashioned airy rooms have been so efficiently compressed that air conditioning is essential.

MR. BURCHARD: "I would rather give up, if I have to, 20 per cent of the space for which I may have asked than to give up the 20 per cent (if that is it) for air conditioning. It is just as important a condition now as having the building stand up."

MR. ELLSWORTH brought up the expense incurred in the loss of efficient work during hot spells. "My colleagues find work to do during the summer, but they don't turn out anything up to their level during those periods. It costs the State of Iowa a lot of money to have that going on."

MR. MACDONALD: "Ordinarily the rule of thumb is that 20 per cent of the cost of the building goes into air conditioning which is too much money. You can get conditions that are quite ameliorative with very much less expenditure than that. The design of air conditioning for the peak loads that occur very exceptionally adds a great deal to the expense of it. I should like to see air conditioning get down to about 10 per cent of the cost of the building. Another thing in connection with the figure on air conditioning is the lack of taking into account the enormous heat absorption that is possible in the contents of the building -- the structure, the books, etc.-- which tend to even out the fluctuations. They put in more than is necessary."

MR. RUSH: "The appropriation bodies -- local, state, federal, or even private trustee boards -- simply will not respond to an appeal to air conditioning for the reader. But they will respond to appeals to air condition in order to preserve materials."

It was agreed to try to get a report on the effect of air conditioning on paper, binding, and other materials from some expert. One of the original objects of the Committee was to obtain such special reports.

MR. BURCHARD stated the question as: "What a library can expect to save on its operating costs with respect to the replacing of books, the intangible and irreplaceable, rebinding, cleaning, and all that sort of thing; how much you would expect to save on that, and then capitalize that against the cost of the air conditioning."

The experience of the Library of Congress with its non-conditioned main building and air conditioned annex was discussed, as was Harvard with its new air-conditioned Houghton Library.

MR. MACDONALD: "A number of years ago one of the engineers of the Bureau of Standards wrote an article for us on the atmospheric conditions relating to books. He proved very clearly that the overdry atmosphere that you get in the heating season in the winter, without proper humidification, was very destructive; as was also the overmoist atmosphere in the summertime when the books begin to mould; and that in too cold temperature the binding of books will go to pieces because the glue is a reversible gel and once it gets below about 25 degrees the chemical composition changes, that it no longer has the elasticity it was intended to have. At that time he didn't go into the matter of the saving that would come from cooling. Of course, that isn't involved in the preservation of books. Temperature doesn't make very much difference, as long as it keeps above 20 to 25 degrees. Sulphur fumes are extremely injurious because the books have a tendency to absorb sulphur dioxide and to change it into sulphuric acid in humid weather, which will eat up paper. That is one of the reasons that our papers go to pieces, particularly in the urban areas where the atmosphere has a good deal of sulphur dioxide in it. I think that man could make quite a contribution to this particular subject. I will look him up."

The whole question was left in the hands of Mr. Metcalf to find a man to make the investigation, if possible.

CHAIRMAN BOYD then expressed the gratitude of all to the University of Iowa for their mock-up, and then proceeded to the plans of Rice Institute.

MR. HEAPS: "We thought it might be a good plan to give you a general picture before Mr. Watkin discusses the plans in detail. Ours is rather a conservative scheme. We have the money available, about a million dollars, and we have this plan. We have studied this for several years, and we have benefited greatly from these meetings. We are trying to limit the enrollment to 1500 after the war, and we hope we won't have to go above that. Our library is as yet rather small. We are planning for about 600,000 in the stacks. We are sticking to a fairly conservative scheme.

"The first thing to do is to find out what the seating capacity should be. We have only about 300 or 400 students on the campus. The rest of them come from town. We have a large number of industries that will probably utilize our library facilities. We have honors courses, and we are trying to develop a graduate school, which will mean a certain type of research library. These things should be considered in estimating the seating capacity, but I haven't found anyone in this body who would give me details as to how to make those estimates. So, we are taking what you people have taken, which I think is about a maximum of 50 per cent. We shall probably seat about 750 students in the reading rooms and in the carrels, but we will have in addition to that a symposium room, and we are trying to get the element of flexibility by utilizing these movable partitions wherever it seems desirable and we can do it.

"We have a reserve book room. We want to put a little coercion on our students and force them into the cultural environment of the

library as freshmen. As juniors and seniors we will try to suck them in by other less delicate methods. With a reserve reading room, I think our faculty will be stimulated to greater activity. They won't be so lazy if they feel they have to do a little work to utilize that space. I think it will have the converse effect to what was suggested last evening.

"The other rooms are largely designed for taking care of the 750 students that we want to accommodate.

"We want a supervised reading room to which the students can go with their own books. At present we have not on the campus any facilities for studying in proper surroundings. We have put that reading room in two sections near the main entrance, and it is outside the control entrance of the building. The students can come in there and go out without putting the traffic up through the main functional elements of the library. I realize that that is contrary to the ideals of M.I.T. We are bringing them up to the portals, at any rate, and we hope to utilize perhaps some more delicate methods of getting them to use the further facilities inside the library.

"The stacks are more or less of the conventional type. We have got to have air conditioning in that climate. Mould and book worms are very serious things with us. We have big losses with book worms and, so far as I have been able to ascertain, there is only one other library that has that trouble. That is the Huntington Library, and they don't have it any more because of their air conditioning.

"These book worms go right through our books and fill them with little holes. I have tried putting them under a vacuum. The drug store beetle will stay in a vacuum of very low pressure, maybe less than 2 or 3 millimeters of mercury, for five minutes and come out and be perfectly active and all right afterwards. We have to have a fumigating chamber with vacuum control. We shall have to do that with all the books we transfer which is a pretty big job. We want to get some sort of device for taking a whole shelf of books at once, putting them on a truck, wheeling them into the fumigating chamber, fumigating them, and taking them out."

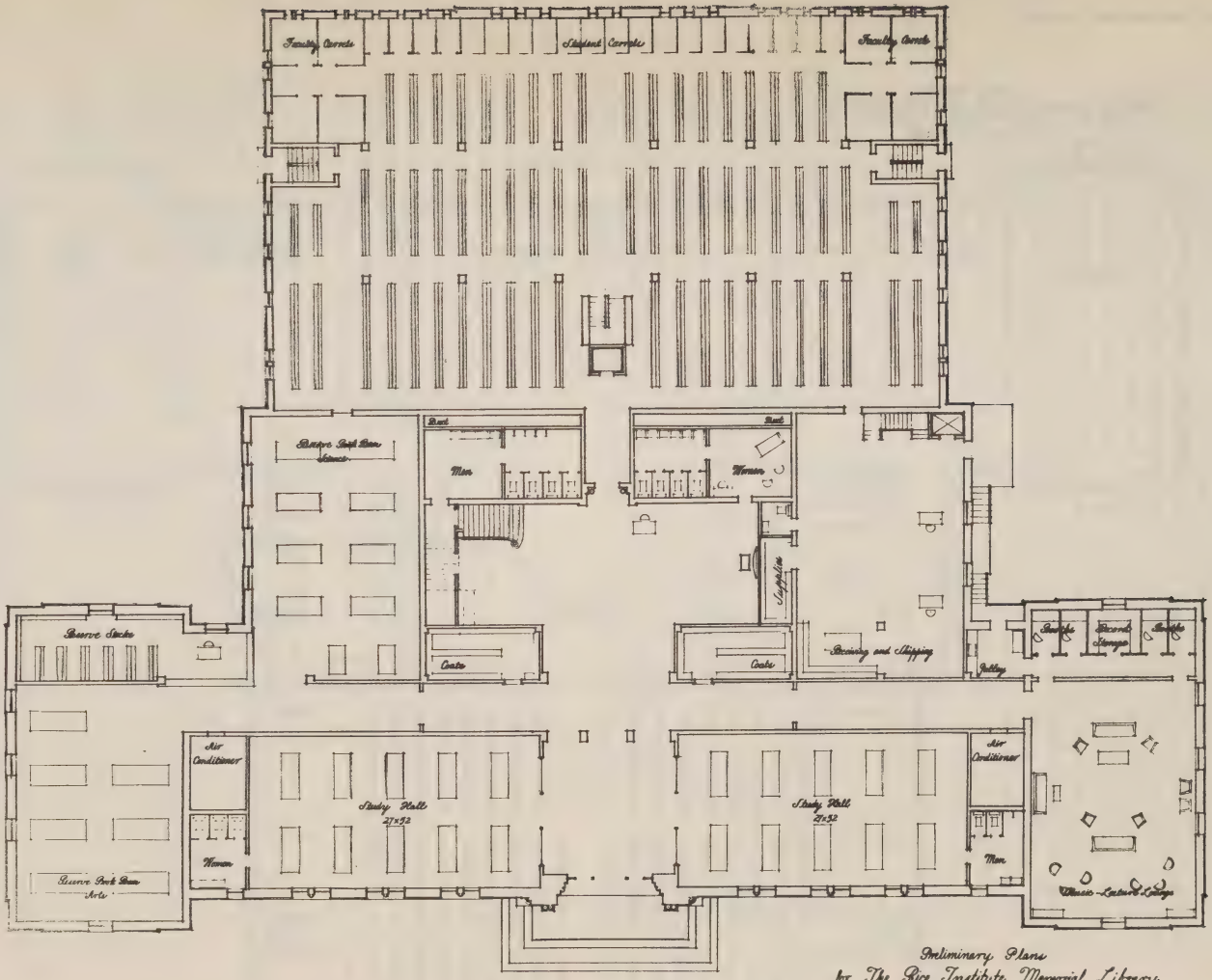
The question was raised whether it would be necessary to call in all books which were charged out of the building.

MR. HEAPS: "I don't know exactly whether or not the book worms will propagate in that air conditioned space."

MR. BOYD asked whether there was danger of a book being contaminated when taken out for use after the initial fumigation.

MR. HEAPS: "I suppose we will have to have periodic inspections. We certainly don't think we can go to the trouble of fumigating every book that is loaned.

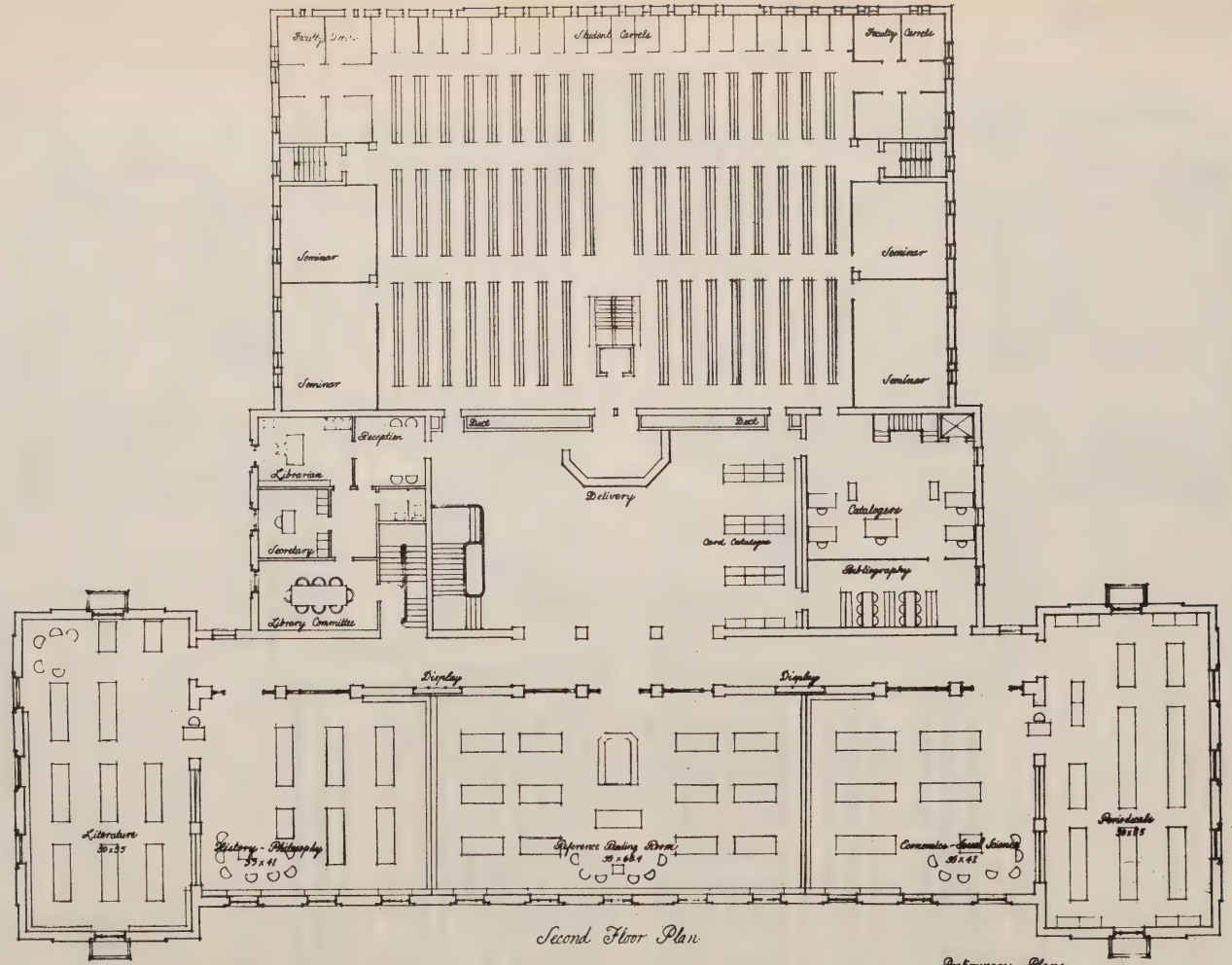
"We are planning the open stack system. We want the students to go in freely. We are not going to encourage the freshmen to go in. We



First Floor Plan

Preliminary Plans
for The Rice Institute Memorial Library
Houston, Texas

Designed by William Ward Watkin, Architect



Second Floor Plan

Preliminary Plans
for The Rice Institute Memorial Library
Houston, Texas

Prepared by William Ward Watkin, Architect

will give them perfect freedom, but we won't encourage them to go in because it does introduce a good many difficulties. We aren't having trouble with thefts, but we find that the person who is not trained takes the books out and puts them in another place, and then they are lost. We are trying to give the freshmen and the sophomores the exposure to all of the books that we would like them to have exposure to -- one or two million books, if we could -- but we are having reading rooms with quite a quantity of books on the shelves in the reading rooms. We will secure a relatively low ceiling and at the same time have books available so that the students will have the proper atmosphere. We hope they will have enough books of the right kind in the various rooms to start them in on their library activity in the proper way.

"I think those are the main points that I wanted to discuss. There are many things on which we should have advice. We have a lot of pressure on the part of the faculty to put offices in the library because it is the only air conditioned unit on the campus. We are putting in about 100 student carrels and 50 faculty carrels, double carrels. They will have locked doors, and will be around 6' x 9', so that they can put in a table and typewriters. We can't have enough study places in the library for everybody, but in addition we have planned a number of very nice places. We don't call them faculty offices. We hope to assign them temporarily to members of the faculty who are writing books or are collaborating with graduate students or who require a stenographer. If they give an adequate argument for getting one of the better faculty studies, then it will be assigned to them temporarily. We have only nine."

MR. WATKIN: "Of the 1500 students recognized, 800 are engineers, which makes quite a little difference in the problem. They, of course, have their own departmental library. Their constant use of the building would be somewhat different from academic students. We haven't had a library, although we have been there thirty years. We had assigned for library purposes a portion of the second floor of the administration building, and little by little it has grown and overflowed and taken basements and additional areas, until the students have been pushed out and the books have taken the place.

"Study space is our very real problem. Home work is done in the back seat of an automobile. So, the appropriate thing, we felt, was to reach the library through one main entrance, and the student there for just an hour between classes has available a study hall with small tables. There is no occasion for insisting that they pass a control. Mr. Metcalf believes that the library should have one good turnstile which everybody goes by, and we should like to see it that way. Once you pass the turnstile, you have access immediately to the heart of the library. We put coat rooms on either side at the entrance, and we put the toilet rooms on either side.

"On the first floor we have a music-lecture lounge. We want to get on a small scale the fine things that we saw at Mr. Walker's auditorium at the Bell plant, corrected acoustically as well as that

was. While it is not intended to seat many, we have this air conditioner, which will be at a higher level, and we do have storage room for 150 to 200 chairs there. Ordinarily it will be set up as a lounge, with booths behind it for the students and with record storage, with the idea of projecting music into this room on Sunday afternoons. It has a little galley so that tea could be served.

"Regarding ceiling height, all the way through the building we worked on the old, conservative system: Two stacks storage in the back makes one room in the front. We came up here to see about stack height. We have set it as being either 8'6" floor to floor, or 8'9" floor to floor. They are not to be supported stacks. We want the same freedom you are all talking about. We are trying to get a minimum of 7'8" in clearance. We would like to get more. We will not have a public elevator. We had it in and took it out.

"You were talking about vistas last night. There is not a carrel anywhere which has not a clear view of the campus. We have tried to keep the stacks in such an arrangement that there is hardly any tiresome walking to get to the stairway, the elevator, or the conveyors. There is no positive insistence on having seminars in the stacks, but they are looked upon quite favorably. There are 12 and can be more. We have committed ourselves to the idea of the temporary partition. Anyone of these can be picked up and put somewhere else.

"In some of our earlier studies of quite a while back we had a memorial reading room of vast dimensions. There was a certain amount of rather high pressure for it. However, it has gradually receded. We have brought it to the regular double stack height and have gained a floor and have saved cubage or floors and made our third floor load a great deal less."

There was considerable discussion, and some criticism, of detailed arrangements in the Rice plans.

Discussion turned to facilities at Rice for the use of microfilm. Mr. Heaps stated that he did not know how much it would be used, and it was generally agreed unwise to plan a special attendant for this work alone. Mr. Heaps then brought up the need to store microfilm on its side, not on the edge. This was questioned by librarians who were storing film on edge.

MR. HEAPS: "One of the members of the Air Corps Photographic Division said that it was rather important to store on the flat surface. It is a very clumsy way to get film out from under each other. The reason for flat storage is that if the films are left for a long time turned up the pressure on the lower levels has an effect on the film which is deteriorating. The man in the Photographic Service of the Navy said that that showed up in their aerial films. Of course, those were big ones and weighed quite a lot. He said that after they stand in a warm climate on the flat surface, they aren't good at the bottom. They weren't sure of that in the Library of Congress, but that was a theory that they had, and it was corroborated by this man from the Photographic Service."

The use of microfilm was discussed. Chairman Boyd felt it would not increase greatly because other methods of micro-reproduction might supersede it. He felt that film would not be used if the original was in any way obtainable. Mr. Metcalf felt that use would increase gradually.

MR. METCALF: "A library like the New York Public Library, with a tremendous public and a large amount of New York newspapers on film, needs a full-time attendant."

MR. RANDALL: "Of course, an Arab won't use a printed book if he can possibly get a handwritten manuscript. We have worked our way out of that now, you see."

CHAIRMAN BOYD: "I was thinking of microfilm as an instrument. I am a very ardent supporter of microfilm, but I think the form of its use is going to be different. One way it is going to be used is the way we are using it in the Jefferson enterprise. That is the use of the continuous process enlarger for blowing it up and using it in codex form rather than in scroll form. It is very cheap. The economies of space are lost, but you get it in a form that will be used by scholars."

MR. METCALF: "We use it in three different parts of the building, serviced by attendants who are doing something else most of the time. Film that would naturally be in the rare book library is kept there; newspaper film is kept in the newspaper room, and so on.

MR. WALKER thought it might be necessary to enlarge the carrels to provide room for film readers, and it was objected that these do not take up much space. "It does if you are using the space for something else. One of the best uses of microfilm that I have seen was by a scholar in one of the libraries I visited, where he was looking out toward a well lighted space and was not constantly having this reader in his eyes all the time. He had space enough to have a typewriter stand and reader alongside him, and back of him were some books that he had, and there were papers to write on at the same time."

MR. BURCHARD: "What you ought to have is a small screen in the carrel and project it."

MR. RUSH: "It so happens that the plans for this building are projected at the size of the building that I now am in. Also, it happens that they have chosen a design that is precisely like the one we have now, the one we are suffering under in an attempt to enlarge the building.

"A T-shaped building is a charming design if you don't have to think about the future, but the time may come when this building will have to be twice the size it is. When that time comes they may do exactly what we are doing down in Chapel Hill. They will darken areas by bringing out wings and putting the ultimate structure back, making a very difficult building to administer. That is probably what is going to happen to this building sometime when these two gentlemen are doing something else.

"Another criticism I should like to make is that this plan through most of the floors is quite like ours, broken up into small areas, even though they say they will move partitions and make them larger. Their spaces are so small in which there are possibilities of expansion that throughout the lifetime of this building there will be small areas. I think we are headed toward large areas rather than more and more small areas. It is very difficult to expand these small divisions, and it is certainly true that the administration of this building is multiplied by the number of these small areas that must be managed."

Discussion centered on the probability that Rice would expand in number of students beyond the outside limit of present plans. Mr. Watkin felt that there was very little chance of so doing.

Comment then turned to the need for putting on one floor the whole process of book order, cataloguing and preparation for the shelf.

MR. BURCHARD: "It seems to me that there is a pretty good demonstration that a number of privately endowed institutions are now able to hold down their registrations, and I think they will hold them. Rice will be in that position, I think. It has the means and position to do so. If they were likely to expand for an increased percentage of graduate students, research facilities for adjacent industry, and that sort of thing, it would require more reference space, more reference librarians, more storage, and more kinds of carrels and study space."

MR. HEAPS: "I would like to have that. Our librarian wanted to have the periodical room, the reference room, the bibliography, and the catalogue room all on the same level, but she said that as far as the order department is concerned, it didn't make much difference. She said she would like to have the typists up on a mezzanine. They can just as well go up the steps and stay up there for several hours at a time behind a glassed in partition."

MR. METCALF: "Is it fair to make this statement? As far as moving the books around is concerned, we have exaggerated the importance of keeping things on one level in a streamline. All the books that Rice will add in a year a boy could move up and down in two days. The total cost of shifting the books around is negligible. The problem is the staff, the time. You don't want your staff to have to go up and down stairs unnecessarily or to walk a great distance unnecessarily. I am interested in what the staff does, not the material."

CHAIRMAN BOYD: "At Princeton (in the present library) we have the order department on one floor and the cataloguing department on the floor above, the normal stack height of 7-½ feet, and we don't like it, not at all. We organized some of those departments under one head. It is now in the preparations department, one continuous process. There is an exchange between those. They have to run up and down stairs."

MR. WATKIN: (asked to show some architecture) "We have a most charming local brick of a soft, clear pink color. We have sought to be

reasonable in the amount of this material. We do want to use marble, because in our climate it remains marble forever, and limestone does almost what it does in Washington. We have kept it very much restricted in quantity compared to our other buildings. We have seen fit to put it where it might do some good. This is not an effort to satisfy any particular patron of any nature, but it is simply to satisfy the general wishes of the community that in so prominent a place the building deserves the importance of a college library. Beyond that, we have tried to be economical."

MR. HEAPS: (replying to a question on the periodical room) "We will have to maintain a certain degree of departmental libraries. We plan to let science, physics, chemistry, architecture, and engineering check out for their own departments what they want for their current use. Those department libraries, in which they are not going to have attendants, will be locked, but we want as many of those things kept over in the main library as we deem convenient for the department. All of the social sciences will be kept in the main periodical room, and we plan to have at least two weeks of the current periodicals kept in the various departments and then transferred over here."

MR. KIRCHHOFF: "I should like to ask one question that is applicable to the studies we have seen. If carrels have traditionally been on the outer perimeter of the stacks, and if a carrel in that position means a little individual window, probably in our northern climate an individual radiator, a screen, and a shade, it becomes rather an expensive little unit. I wonder whether the carrels could be brought together in the center of the stack, having the shelving around the outside for some conveniences, robbing the carrel of the outlook over a beautiful campus."

MR. WATKIN: "We felt the outlook was really desirable. We are putting there a window that is only 1' x 3'1", and we are grouping them differently in the end sections, as you know, so it doesn't become annoying. There are only 20 of the student carrels in a batch there. Then you have the faculty carrels, which permit a larger treatment of the windows. Air conditioning is no problem at all. There is no radiator or screen. Whether we seal the windows or don't (we probably shall), we will certainly have them so that they could be opened if anything went wrong."

CHAIRMAN BOYD: "We don't have time right now to take it up, but we shall. The point you raise was one of the determining factors in the abandonment of the 1940 plans at Princeton, where we had over 800 carrels with 2 feet of window space for each one. It gave the architect a terrific problem in wrapping about three-quarters of a mile of fenestration around the perimeter of the building."

Comment turned to the need for vistas from a carrel, the need to stop reading, look out and think. Mr. Metcalf mentioned the lack of this at night in many places.

DR. DAVID: "I should like to point out that we have now gone well into the second day of this conference in complete comfort, and we have sat here in the midst of beautiful vistas and haven't seen them. When I opened the door and saw the afterglow of the sunset last night, it was the one bit of esthetic vision that I have had in the course of the period. I didn't suffer for it."

CHAIRMAN BOYD: "Speaking of this particular model, I should like to say this for the record. I should merely like to observe that we have been meeting here for several sessions, several hours, with over thirty men (forty yesterday afternoon) in a space of about 450 square feet, with ceilings 8 feet high.

"At Princeton we have been forced to a compromise. I may be rationalizing, but with the interior carrels, the man who wants to think or to go out and gaze upon the vista can do so in his conference room. He can smoke; he can sit down in a comfortable chair, and so on.

"I should also like to point out that in many of the great reading rooms, at Columbia and many other places, in the past we have deliberately raised the windows, put them high up so that a man reading could not look out. I don't know whether it's good, but it was done. It was rationalized by architects and librarians."

MR. KIRCHHOFF: "Some industrialists have placed workmen at close application work on the ground floor near a city street or sidewalk and didn't want outsiders to converse and see, and therefore they have put totally obscured glass in. They have also discovered, after a little while, that they had to take out one row of that glass and change it to clear glass to give that change of focus, but they did it above the eye line, so they still did not get a view of pedestrians."

(Meeting adjourned at 12:40 p.m.)

SUNDAY MORNING SESSION, OCTOBER 28

The meeting reconvened at 10:30 a.m., Mr. J. P. Boyd presiding.

CHAIRMAN BOYD: "We should start at once with the M.I.T. plans. We want time for Mr. Bailey to talk about the carrels as planned by Snead & Company. We also want to take up the tripartite memorandum which was called for by the Columbia, Mo., meeting."

MR. BURCHARD (for M.I.T.): "I just want to talk about the conditions under which this had to be developed, and then Mr. Walker will tell you how far it has developed. The last time I met with you (in Princeton) we hadn't even written this program, but since then that has been completed. The next problem was to find an architect. The basic thing we did was to bring in an advisory committee on the selection of an architect. That committee brought in its recommendations to us, and then we made a very limited number of recommendations to the President.

"It turned out that the architects wanted to do their own research. Mr. Walker, Mr. Stephen, and Mr. Anderson went many places. They came to see many of you. I went sometimes.

"From that developed two or three ideas. It finally came to a point where the program might be solved by one of two approaches which are rather basically different philosophically. At this point there were two things to be settled, and I should perhaps digress here for a moment.

"Right or wrong, we have at M.I.T. a situation in which our basic communication and basic travel of any member of the staff or of the student body is indoors. We don't have a beautiful campus. We don't even have very many places where we have grass and trees. Beautiful as our view is in a panoramic sense, it is almost invariably windy on the basin. We don't have a good environment for our buildings outside. That, plus the Wadsworth plan, has led to the long-established habit of walking inside just as far as you possibly can and never getting out if you can help it.

"It has some merits. If you set out to see one person on business, whom you must see, and you are progressing to his office and go by somebody else's office whom you have perfectly well intended to see sometime, you drop in and see this other man. We have there a very real departmental cooperation which isn't as common in most places.

"That is important here only for this reason: When the final decision had to come as to where, we had the site of the library pretty well located. The real question came as to whether we should make this a free-standing building or whether we should also make this connected between the Walker Memorial (principal student lounge and eating area) and the humanities section of the Institute building. That was approved by everybody.

"There remained one other decision, which was to involve our selecting between two quite different proposals. The basic resulting difference was whether or not what might be called the serious reference functions of the library and the serious working tools (the card catalogue, the bibliography section, the reference section) should be put on the second floor in order to bring other things to the first floor.

Our building committee consists of the Executive Vice President, the Treasurer, and the administrative officer most concerned with the building to be built. We don't have other people deciding anything. After the corporation has determined how much money we can spend, if there is any selling of the aesthetic that has to be done, it is done with this one building committee. I think that is a very good principle, and other places might profitably follow it. You librarians are the real customers for libraries. The fellow who has to run the building is in a pretty small group and has a pretty good chance to make his way.

CHAIRMAN BOYD: "The faculty comes in at a point after the program has been written."

MR. BURCHARD: "I should point out that the building committee has to be careful not to wreck the program. It is easy enough to do it.

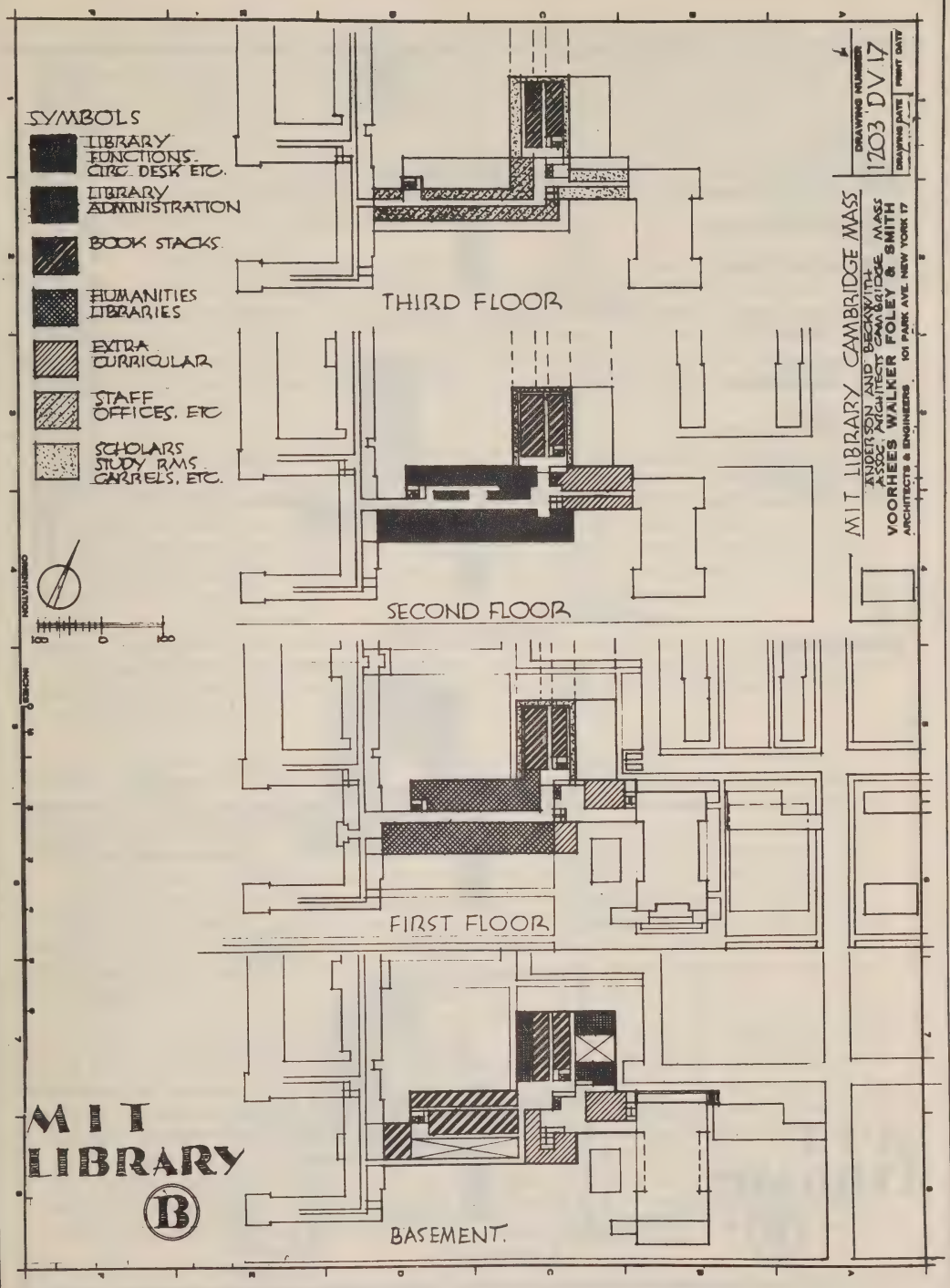
"The questions we had were: First, could we connect? Second, which of the two general schemes should we attack? A decision was taken by the building committee, and the architects now will proceed to the next stage, which Mr. Walker will talk about."

MR. WALKER set up a model of the campus and buildings to show the relationships of existing structures.

MR. WALKER: "It so happens that all the teaching to undergraduates for the first three semesters and almost up until the junior year takes place in one area. That is very fortunate because of the problem of how to introduce books to the undergraduate, how to get them interested in books, and how to sell, frankly, this customer who is coming in. It is absolutely necessary to get this general educational period in the area of the campus so that it forces itself on the attention of the students.

"This opportunity of joining these two factors -- the recreational group and the undergraduate teaching group — is one that very few schools that I know of have, and we early came to the conclusion that we would take advantage of it. There are several ways of doing it, and this represents one way of taking care of it. It is our general plan to move toward the river with our building, rather than into this back area which is industrial in nature. The connecting area between the two building groups is about 350 ft. wide.

"Our floor levels vary slightly as they go up. We have done that so that we could get direct communication across, if we wanted to hit the floors on both sides.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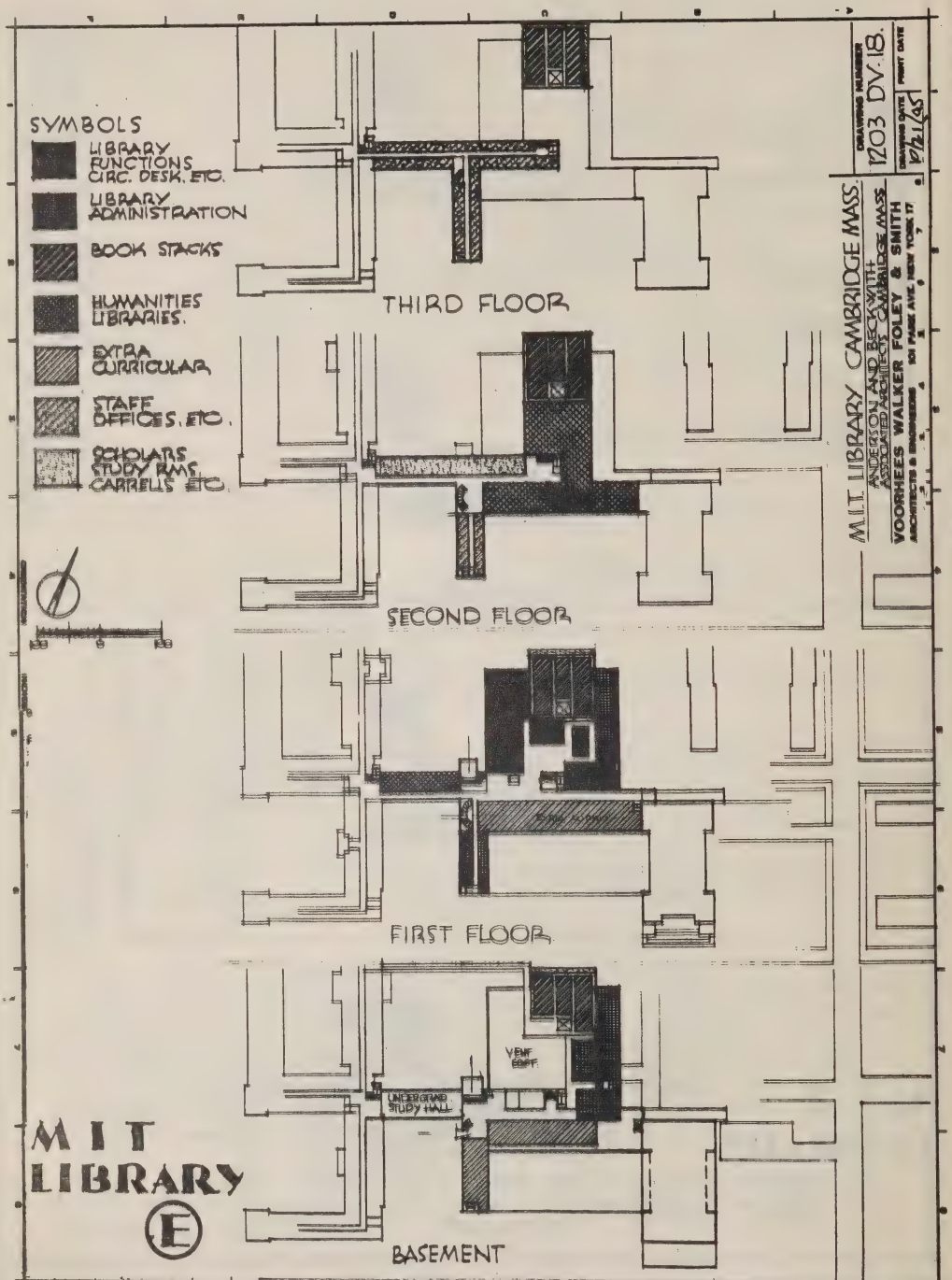

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"Both of these schemes can be worked through some module. We have no difficulty in our mind in coming to feel that, when we get through with the disposition of these masses of space, we can assign any type of building construction to them. Don't be concerned for the moment with any detail except the allocation of space, which is the only thing that we are now concerned with. What we have been trying to do is to find how to make this library mesh into the teaching staff that is in this area and how to form a progressive and intelligent grouping around these two corridors on the main floor.

"Our philosophy was stated this way to the building committee: We believe that the first introduction of the student to the library should be through books, that he should not come up against the monumental character of a building with a grand stairway, nor that he should come directly up against the administrative functions or the library functions, either. In other words, he should think of the library as being a place for books.

"In this case, one of the humanities libraries, a recreational one, is right off the entrance to this major building so that you pass the reading room on the way to the center of the library. So, off the corridor we build a library center. It is on the first floor and very compact. Across, we have the lecture rooms, music rooms, and other things that have an interest for the undergraduate -- and the graduate, too -- on his line of traffic.

"First, this becomes a friendly introduction to books, and then it furnishes an opportunity to expose the student to exhibitions that you want him to see or to bring him in to hear somebody who may talk about books, and so on.

"Our stack goes down to the basement, and we have receiving rooms, printing establishments, reproduction establishments, etc. there. And again we have exhibition space. Our basement is really a pipe shaft. Those of you who were in the Bell Laboratories have some idea of the basement at M.I.T. It is very much the same thing. It is usable space, but it is on a soft bottom. We are not going down into the ground. Everything is above ground and on piles. We are not going to try to waterproof extensively. But we can get a story of stack in that level so that we can tie a stack into any reading room group, if we want it. Air conditioning and building equipment space takes up about 35 per cent of the basement.

"The undergraduate, who comes in for a little questioning about his mental capacity to take on the job of being a student at Tech, is a little bit alarmed at the amount of time and serious study that he has to give. He is immediately plowing into his studies, and he hasn't too much leisure time. As he becomes interested and his professional study becomes almost a "must," his time for relaxation is very small. M.I.T. says that during his four years 25 per cent of the curriculum will be used for so-called cultural studies. We have got to make the thing so attractive and so ever-present in the mind of the student that, as he

gets enmeshed in his professional work, these things are still so evident to him that he may be inclined to steal some time and use it in the manner of relaxation and try to find the leisure time to use them.

"On top of that, you have a growing demand through this undergraduate group for some research. It starts practically at nothing in the freshman year and becomes a sort of widening wedge as it comes to the senior year, when the man writes a thesis. This research part of the library, as it applies to the student, is one of demand rather than of willingness.

"In addition to the undergraduate who is doing research, there is, of course, the scholar. The research reference library under Mr. John Burchard (he can really tell you what he hopes to do with that) is another problem. It is not going to be a general reference library. It is going to be a specific one. That is why our stack may look small to some people.

"These five parts represent the five functions that we think of in the library. On this floor plan we have tried to introduce to the undergraduate student the sense that a library means books and that it means a widening of his vision, broadening of his life, through exhibitions and other things that he has to pass. At the same time, there is this other factor of life, the reference library, which is going to become a tool for his after-life. It is going to be quite a strong tool for a good many men. It is going to be a strong tool for the chemist, for the physicist, for the architect, because of the fact that architects no longer look at picture books. They try to analyze their problem from the standpoint of function. They have to know something about the industry that they are going to meet."

MR. BURCHARD: "There are things in here which are not ordinarily library functions, which at least are not regarded as a serious part of a library. We are going to be responsible for the best lecturing in the Institute of a non-scientific type. We simply have to take custody of all the extra-curricular general education the student at M.I.T. is going to get. That has been gladly taken on by the Director of Libraries. Along with the Dean of Humanities, we have the non-curricular responsibility.

"The other point is that our so-called humanities are more than general education in one or two fields. In economics, we are beginning to develop a very strong economics staff especially in labor relations and things of that sort. English and history are still very much service courses. We have already taken one step to correct that. When we talk of humanities libraries other than general reading collections, we should realize that those libraries are becoming more and more like other departmental libraries and do contain tough tools as well as interesting books in the humanities."

MR. WALKER: "In other words, the English teacher up at Tech thinks that he might very properly be the one to teach the use of the

library, rather than the librarian. There is no reason that this teaching of the tools of the library should not be directly used with his first approach to the library, rather than going later to a more formal class, like the slide rule class, where you are taught to do it. In other words, try to take the mystery out of it by just coming into it slowly and casually rather than formally doing it. That might easily develop under this scheme because each reading room will have its own library. In technical research, which I know something about from the industrial side, the Librarian is as important a creature as the catalogue or the bibliography."

MR. WALKER then turned the discussion to a second model building under consideration.

MR. WALKER: "This other library is very definitely based on the idea that we put the humanities on the first floor, the reference library on the second floor, and the teachers on the third floor, and that we bring our vertical communication very close together and make it adjacent, so you can move through the building.

"Entering we come into all our humanities reading rooms on both sides of this fairly wide, generous "street" from which you can look into these libraries on each side. You come to a lecture room here and an exhibition room there. The stack can be met here or, as you know, the stack can be brought under on the first floor so that these rooms, as at Enoch Pratt, can feed down directly into the first dispersal of books away from the open shelves above.

"On the second floor you have nothing except the tools of the library and the entrance to the stack.

"On the third floor you have the offices of the humanities department, again with opportunity by keys of going into the stack, with studies and carrels around the outside. Again there is definite vertical transportation, tying the whole thing together.

"Just to give you some idea of the problem of meeting floors, the first floor to the second is 16'6"; the second to the third is 15'6"; and from the third to the roof or to a lower level, because we don't have to have this necessarily the same ceiling height, 13'6"."

MR. BURCHARD: "The stack is for a million volumes, and we do intend to rely on the New England Deposit Library and are also working out with Mr. Metcalf the best possible non-duplicating system we can arrive at. Our present holdings are about 400,000 volumes.

"There is one other point. The humanities teaching which is done in this building in either scheme is at the junior, senior, and graduate levels. That teaching which is done in standard classrooms or large size or in large lectures is still done over in the main building, but we are arranging the offices in either scheme in such a way that there will be a chance for small groups to be taught in a man's office,

a little larger number in adjacent conference rooms, and then finally the formal seminar room. That type of teaching is all done in the library.

"The humanities faculty were very clear that they would much rather walk some distance to classrooms in which they were going to give the standard freshman and sophomore teaching if they could otherwise be in the library for the use of the student to whom they paid more personal attention. We don't want to bring conventional classrooms into this building."

MR. WALKER: "We have a 16 or 15-foot clear height; why not take advantage of it for these reading rooms? We have Greek architecture to be concerned with, and we have the question of related scale. In both these designs you will find that we have presented ourselves with rooms that would help us to achieve that scale, rather than smaller things. We will endeavor to run the window from floor to ceiling, just big sheets of glass going straight up from floor to ceiling."

MR. BURCHARD: "This is the first scheme that I have seen proposed at our meetings which is literally not in any way bound by an axis of any sort. Some of the buildings may not be bound by classical architecture or Gothic architecture, but they have been bound, as far as I have seen, by some form of axial thinking. I should like to call your attention to the opportunity before us for widely varying and often equally challenging solutions for expansion in many directions for any given facility the minute you can avoid that concept."

CHAIRMAN BOYD: "It seems to me that here you are definitely limited far more than we are at Princeton. You are limited as to your floor heights by the flanking buildings."

MR. BURCHARD: "I don't say that we haven't limitations on our building, too, but I am here talking only of the limitations imposed by the axis.

"The decision to connect the buildings is based on a set of habits at the Institute. To make a free standing building would certainly involve leaving considerable distance between each of the two other buildings and would make us, therefore, extend much farther into the lot and cut down the green in the back. Once you decide to go across from building to building, you are certainly limited by the existing floors. Our vertical freedom is not as great as yours. I am talking about freedom of plan, the non-axial approach, which may end you up with an axial solution. When you first start an axis, it leads you to balance, and the balance may force you to do things which you don't want to do."

MR. WALKER: "The one difference in concept that I find between both of the schemes and most libraries that I have visited is the idea of trying to bring people to books immediately. You come in and see books. In most libraries you have a terrible time seeing a book that you can pull off the shelf. You get all messed up with the architects' and the donors' ideas of having a monumental entrance and the librarian's idea

that you must see the tools of the library immediately. You must come up against this thing as a matter of control. In this matter of control, the user sometimes has been lost sight of and the psychological reaction of the user has been lost sight of. We are trying to influence these boys as much as we possibly can on their normal line of travel, which I think we are very fortunate to have."

CHAIRMAN BOYD: "I think there is another side of that. I am thoroughly with you on the business of seeing books the minute you come into the entrance. Yet, you have got to put the tools out front so that the man can see them, because he doesn't go in just to look at books and select them; he goes to find out how to approach the library. You have to have it convenient and immediately available."

MR. WALKER: "I tried to indicate the different types of convenience for the undergraduate who is doing research, the scholar doing research, and the faculty member who is doing research. All of those approaches seem to me to have elements of time connected with them, too. The matter of time becomes less important, in my way of thinking, as you go up. Those men at the top can afford to wait longer for the delivery of a book, if they want it. Their research is over a longer period. The undergraduate has to do a daily theme or something and has to get it right away. I know that in industrial research, where money matters, where cost is a factor, to the man who is doing the research and to the company who employs him the question of twenty-four hours or forty-eight hours is not considered important.

"This is the basic problem: How soon do you want to introduce the student to the reference library as the main factor in his life? Then, having done that, where should it be placed in reference to this idea of introduction to books?"

A request was made for more information on the normal traffic of each three floors.

MR. BURCHARD: "The first and second floors of the Institute, as they are now, carry the main burden. The first and second floors are almost equal with respect to undergraduates. The third floor tends to go into upper laboratories, research teachers, graduate students, etc."

MR. BURCHARD: (discussing two floor arrangement plans being considered) "You pass by these amusing extra-curricular things in display on the main floor. Those are forward. At the same time, you immediately are aware of the tools of the reference library and can pass into the reference library quite as easily as you pass over to the other side. The other advantage was that the humanities faculties were nearer to their working humanities libraries, which are on the second floor. Those are the economics library, history library, map room, international relations, and that type of collection.

"Those who favor the one scheme hold that it does not give you enough books and that all these humanities libraries, some of which are

recreational, some of which are very serious and full of pamphlets, do add to the feeling of being in books and that it isn't necessary to present this research thing. I believe they would say that there would be less disturbance to the research area if you ran this on the floor above."

Both Mr. Burchard and Mr. Walker believed that the plan of arrangement could be changed after building, if their initial decision turned out badly in the light of practical experience.

MR. WALKER: "We forgot a very important factor in both of these schemes. We started off with a study hall, as I remember, for about 100 students. We have discarded that. In going around the library, we find that the departmental libraries are used for study rooms by people taking courses other than that to which the library is devoted. They are not a nuisance. Each one of our main reading libraries has been increased enough to take care of those 100 students, with the idea that they can come in. This is wholly an open shop. We hope we are welcoming in to history and literature some of the boys who may not be directly interested in them, or in economics, something which they may not get until their third year. They become accustomed to being in these departmental reading rooms for study. We are not just putting them in a bare room with some desks, and so on, and saying, 'This is where you have to study.' We are inviting them in to reading rooms to study.

"That brings up the story of what we do with these boys whom we get here. The librarian should help the architect determine his space values as to how much space should be between boys studying at a desk, how much space should be given to them to spread out books. Can we work out chairs that they can put their clothes on, and how about the difference between browsing, and so on.

MR. ELLSWORTH: "According to the first plan, your faculty research men are up on the top floor, the third floor; then, a few on the second. The reading areas are on the second floor. So, the faculty and the students are reasonably close together. On the second plan your faculty are pretty largely on the top floor. They are separated from the students and the reading room by two floors. There is a rather clear-cut issue. Do you want your faculty to be bothered, if there is such a word, by the students, or do you want to bring them together? That is an institutional problem."

MR. WALKER: "Those of the faculty who were interviewed were very definite. They said they would like to be near the library. They would invite the students to their rooms. A good many of these men at the present time are two in a room, and they try to have conferences going on in their own offices about quite different things. The main thing that these men wanted, from my interviewing with them, was separate places to interview their students. We went as far as this in talking about it: 'Suppose we developed an office building for you with all the things that go in an office building, a reception desk, people to take care of your appointments, and so on, would you like it?' They would rather have the boy drift down to them through their own offices.

They said there was a contact formed in the class, that the boys came to them through that contact and did not just come along on a sudden impulse and say, 'I want to do something.' The majority of them are very definitely arranged from a contact. If that is true, then the relationship of the teacher to the student is something that can't be controlled."

MR. BURCHARD: "They expect to do all their advanced teaching in the building, in their offices, in the seminars, or in the library rooms, and not anywhere else. They want the students in there. They are not trying to kick them out."

MR. ELLSWORTH: "I judge your first plan would draw them together more naturally. I wouldn't state that as exactly a positive reaction, but I have a feeling your first plan would do that."

MR. BURCHARD: "I think it isn't exactly clear to those who don't know our problem what we mean by these humanities libraries. They are of all types, including the purely recreational reading library, such as the Frank Cilley, which is an enormous factor in our life. We don't have any other place for people to read in any comfort a casual book. Differentiate that, as a humanities library, from the Dewey Library, which is the library of economics and contains serious tools, which is really now a departmental library in the central library building. Our other departmental libraries are crowded by freshmen and sophomores. The Eastman people, the physics and chemistry library, can't always take care of the graduate students, to the point that we have to take administrative measures. Some of the humanities libraries on the first floor may encounter ultimately the same difficulty with respect to freshmen and sophomores. You have to weigh whether it is more worth while to get them in or whether finally you have to keep them out in order to take care of the people who are doing advanced work."

MR. RUSH: "I know perfectly well that I could administer this building on the right much more readily. I am positive that the beginning students, the freshmen, would use that building much more understandingly than the other. I am sure that the faculty, after they became accustomed to being separated upstairs, would think it practically heaven for them, no matter how much they want a student to come in. I know that that would be the easier building to run. It is more compact; it is more centralized; it is more concentrated in materials. The reference to the services are on the second floor."

DR. DAVID: "You have grand elevator service. That really is assumed in both plans, but the elevator service in some ways, it seems, is a little better in this one than in that."

MR. WALKER: "As it approaches the tightness which we are going to try to achieve, we will endeavor to take the benefits of one over into the other."

MR. ELLSWORTH: "On your second plan you concentrate more faculty on the third and more books in the bottom, on the assumption that

their interest is more with the reference tools than with the books in the bottom. I don't believe it is sound."

MR. WALKER: "The main difference is whether you walk the student on his main line of travel through reading rooms or whether you walk him through the reference library.

"When the faculty get into an elevator they might as well go two floors as go one. If they are going to teach in a reading room, in either scheme they can go down to the room easily by elevator if they are carrying books with them at the same time."

MR. BURCHARD: "I don't agree with Mr. Rush about administration. In the left-hand scheme, the recreation room, the librarian's suite, all the exhibition spaces, lecture rooms, and so forth are outside the control. Then you come into what is pretty much the conventional approach to the library. You hit the catalogue, the circulation desk, and the entrance to the stacks. From there on, everything above that is controllable. It seems to me that, as far as control of books is concerned, the administration is easier in the left-hand plan. I think also processing is easier."

MR. RUSH: "I used the word "administer," but what I was thinking about when I used the word was your great desire at M.I.T. to get 98 per cent of the students to use the building you are going to construct. I am dead certain that I could more easily persuade a majority of the students to use this building understandingly than I could the other. The matter of processing and the materials part of administration seem to be better organized in the left-hand plan, but to sell this building, in business terms, to the student body I am certain is easier than in the other."

MR. RANDALL: "There is one thing about the second building which to my mind bears out what Mr. Rush just said. You could sell it to the students more easily because the thing they are least pushed to use is the closest to them. If you use the reference room, you use it because you have to use it. You can afford to put that farther away so that it takes more effort to get to it. If you want the student to browse and read and become acquainted with books, his natural impulse, unfortunately, seems to be not to do it. So, you want to make that as easy as you can. You put that down where they are struck in the face with it right away. If they are going to use the catalogue, they are willing to take that extra trip up to the second floor and find the catalogue. If they come in and see books, it seems to me they are much more likely to use the books.

"I don't like that reading room on the first floor because I still have the feeling that students on their way to the library are going to go right past it on their way to more serious business there. You have it too close to the reference room. You have to go through the business part of the library to get to the main reading room."

DR. DAVID: "I want to raise one question with respect to student traffic through the building and control. This is not a library with a single entrance on the ground floor. I suppose there is only one entrance on the ground floor, but in addition to that there would appear to be in both plans entrances from each side at every floor."

MR. WALKER: "Both plans contemplate having the main traffic only on this floor. We are definitely cutting it off so that there isn't through traffic on these floors that have to do with the control of books. In the plans either you have a librarian and reading room or you have a desk with central control."

DR. DAVID: "You have traffic right through the building from Walker Memorial to the educational building at the other side at the ground level. And you have traffic in your building from the educational buildings on the west at ground level and second and third levels. As the students pass through the building or into it, I get the impression that they are not herded into corridors, but they are taken right through reading rooms in some cases."

MR. WALKER: "No. It is a main corridor street from which we hope, either by glass openings or great doors, to look into the reading room. We think we can take care of the question of obnoxious noises."

MR. BURCHARD: "I think this is an important point. On the one plan you can look at the thing as a corridor. You might, as far as the library is concerned, look at it as a street passing in front of the library. You turn to the left off the street as you would anywhere else and immediately hit the catalogue, circulation desk, bibliographic tools, and reference room and the things behind the control. That can be very well secluded from the corridor traffic. It is right there, quickly available. The other things you pass by are not of that sort. You go by a reading room, which you are now working hard to get to, which would be separated from the corridor by glass. Otherwise, you go by an exhibition room. I might say that one thing that is bad about the second plan is that the exhibition room is not on the first floor. It can be put there.

"Anything that you go by on that street (we call it a street) which is toward the river, then, is either purely the top administration of the library or these rooms which are either exhibition rooms or places where you hear music or a lounge to which we hope people like Robert Frost will come sometime."

MR. ELLSWORTH raised the point that the passer-by on the interior street could look in at the reading rooms through the glass wall, but the readers would also tend to look out at everyone who went past. People would look up, like a flock of turkeys. "I wonder what will happen, on the basis of what we do know about the habits of people, to the people in the reading rooms there when they see great numbers of people going by. Maybe it doesn't matter. I don't know."

MR. WALKER: "In this type of reading room we expect to have the entrances to it from one side, rather than from the ends. Again we have given a great deal of consideration to that. A man coming in to the

reading room doesn't pass down by ten or twelve desks or tables to get to a place that he may find vacant. It is an observation I have made that people congregate into corners of reading rooms. They rarely sit in the middle. Why they do that I don't know. I think it the mere matter of the old sense of being up against a wall rather than being out in the open room. We are endeavoring as much as possible to take the corridor out of the reading space and make it a corridor.

"Most of the students will pass through the library every day on their way to and back from lunch. So, through this thing once a day you have the opportunity of catching a whole lot of people."

DR. DAVID: "The difference of conception of handling traffic in relation to what is going on around them in the building between this situation at M.I.T. and the situation in the Bell Laboratories, which I visited with you, sir, is that in the Bell Laboratories you have a group of researchers who have already been educated, and, therefore, they don't need to be led into what is going on in the laboratories; whereas here you have a crowd of boys who are just being introduced into life. I was just thinking what would happen in those vast corridors in the Bell Laboratories if you put in glass and opened those up so that the whole traffic there went back and forth."

MR. WALKER: "Ford had this idea of trying to sell the character of his car very early in his existence. As you go through on one of the main routes in the River Rouge plant, you go by the machine shop, you go by the laboratory, and you go by a whole lot of things. When I saw that I immediately questioned whether that was not a disturbing factor. They said it was for a while, but that under the pressure of doing a job, you do the job. It is rather effective actually to go through the River Rouge plant and see these different laboratory jobs being done through a glass wall. You may have somebody working alongside this glass wall without very much distraction. That is different from reading. I am not thinking of a glass wall that runs the entire length of the reading room, because we can't afford the space. There should be walls to put maps on for instance."

The question of control of the reading rooms and the loss of books was raised by Mr. Metcalf and Mr. David.

MR. BURCHARD: "If a man deliberately wants to steal a book, we won't control it. We are not going to use an electric eye, and we haven't a turnstile. If he wants to get a book, he can steal it. I suspect if he wants to slit a book he can do that. That is our present system in all our branches where the rooms are not too big or are under reasonable control. It hasn't been a very serious problem for us.

CHAIRMAN BOYD: "My preference is for the first plan, and for several reasons. I think it is much easier to administer. Your library services are more compact. You bring your faculty and your teaching departments closer together. You have the main flow of your traffic through the first floor there, with the students having an opportunity to go into

this general browsing room and in to the extra-curricular activities. Also, you bring them bang up against the whole control of the library, which I think is terribly important. You must have that kind of thing as near the entrance and as near the main flow of traffic as you can possibly get it. Whether these freshmen are textbook students or not, I don't think you can teach them too soon how to use the library."

MR. KERR: "I also favor the first plan. The proximity of faculty and reader is quite an advantage. To me, the second plan on the main floor plunges the student at once into the Grand Canyon of Lower New York, into Wall Street and Broadway, before he has a street directory or telephone directory to know his way around."

MR. WALKER questioned how successful librarians have been in introducing students to books via the medium of reference tools. There was considerable discussion around the point and some admission of failure. Mr. Boyd felt it was a failure of instruction.

MR. WALKER: "I am not afraid of the tools. The point I am making is that I have come away with a very definite reaction, maybe a false one, that you haven't been too successful in selling the book to the student, that you are trying to get away from the traditional library. You want some other way of handling this problem of getting books to the student. It seems to me you should open your minds a bit about your own administrative problems and see whether you haven't gummed up the student by administration. A good deal of the faults of the library, as they came to me in my reaction to them, was still coming from the idea that a man in a central high pulpit should look over the entire library and control it. My reaction was that he was trying to do too much of that, rather than to have a situation so that you can just pick a book off the shelf.

"I used to joke with my partner, Frank Voorhees, about the 3,000,000 books that were going to be in the Princeton stack and through which the undergraduate was supposed to browse. You just don't browse in a 3,000,000 volume stack."

CHAIRMAN BOYD: "The fault of the traditional library lies not merely in that sense of control of the librarians, but also in the lack of effective tools. They are misleading, but they are not nearly so misleading, not nearly so false in the direction they give to the beginner, as this business of going to a stack and pulling off a book. Imperfect as our tools are, they still give you a broader conspectus of what is available and the best that is available than any amount of classification.

"You want to get away from the librarian's control. When you make a small selection you are interposing another control. You are interposing the selective process of perhaps not the scholar but of the classifier or cataloguer, who decides arbitrarily whether a book goes in this place or another place. The beginning student looks at it and he gets a very false impression. What is more, he knows how to use the

Cilley Room, but he doesn't know how to use any other library. I think you have to teach them to use what tools we have available, and teach them at the earliest possible moment; not impose it on them necessarily by the librarianship, but impose it on them by pedagogical method."

MR. BURCHARD: "If you don't know how to use the Avery Library at Columbia, if you don't know how to go to Pennsylvania, if you don't know how to go out to Widener by some common methodology, every time you go you have to learn the common geography. You learn the local geography in your own local institution, and after that you are completely stuck. That is not true of the slide rule, the laboratory, or the drafting board.

"When you start saying that library tools have failed, you must realize how recently we have emerged from the textbook era of education. I think the allegation against the librarians on this score rests on the staff of the institutions and not on the librarians. Until the faculty know how to use the library, until the faculty are interested in having the people use the library, until they direct their education in the direction of using the library, of course nobody is going to know how to use the tools.

"The reason we force a man to learn to use the slide rule is so that he can multiply faster and with somewhat less accuracy. The real reason is that we give him so many problems, if we insisted on his figuring them out, he would never get through. The same process can be applied, with some differences, in the library world. Once you do that, you have got to come to this central system of finding out where you are going to go from there."

MR. AMBROSE: (Discussing the two M.I.T. plans) "You don't know whether your traffic will originate on the first floor or the second floor. Perhaps it will originate on the second floor, and you will want the main items on the second floor of your library. It may be on the first floor. It may change from year to year. I come back to my old argument that a library building must be as flexible as it possibly can be made so that it can adjust itself to changing conditions, changing teaching methods, changing times, which cannot be foreseen as much in a library building as it can in some other types of buildings. That seems to me to indicate the No. 2 plan because there is a possibility of vertical change in function that you lose in the No. 1 plan. There is fundamental stability in No. 2, but there is that vertical flexibility of function."

MR. DOANE: "I think the balance is slightly in favor of the first plan. As you suggested, the reference, general catalogue, and administrative offices are all grouped together. I like the compactness of the second plan. It seems to me that if you could combine those two in some way, you would hit the more nearly ideal arrangement. The second plan seems to have a philosophy of the general diffusion of knowledge at the lower level, gradually specializing until you get up into the advanced grounds of research on the top floors, so to speak."

CHAIRMAN BOYD: "I think Mr. Doane's comment is a very fair summary of the discussions that have taken place on these two plans. I shall ask Mr. Burchard which plan has been decided upon."

MR. BURCHARD: "'Decided upon' is not the right term. It has been decided upon, but it is perfectly ready to be re-opened. The first scheme was the scheme which was selected unanimously, primarily for the reasons I tried to give a little earlier; namely, that we should bring them to the library tools at once; that we should have the library in a big block at the back, on a street; that the rest of the building was a street, an indoor instead of an outdoor street; and that we should have the other facilities for which I am also responsible, which are not usually the librarian's responsibility. I have all the exhibitions at the Institute to operate. That was the basis."

MR. WALKER: "Mr. Burchard left out one important point of the decision, which made it all the more difficult. We were to try to get the virtues of the first into the virtues of the second. In other words, we tried to get the compactness of the second with all the things of the first. That is not as easy as it sounds, but we shall achieve it one way or another.

"One of the main faults of this plan was the separation of this stack off by itself and so far away from the center. It was an extreme thing. We were taking up too much land in that back space. If we had future growth, it would destroy something. One of the things that the Institute is much concerned with is the constant change. Even with the building built on a module system, the module may happen to be wrong in size, even though it seemed right when put in. The module of use changes a little bit in time."

MR. BURCHARD: "I think the way you (Mr. Walker) proceed on a building of this sort is extremely interesting. As a firm, what do we do now on the basis of what we have got out of this discussion and consideration?"

MR. WALKER: "We go on just the same way as we have been going on, strangely enough. We don't go into details from the standpoint of working out. We still try to find out what the answer is on the simplest, broadest terms. We finally evolve this thing, if we go along on this basis, so that we get our services away from the things that we intend to change or that look as if we might change. In other words, the services will be very definitely along a corridor wall or along an outside wall and come up, so that we have freedom. We will go away from columns as much as we possibly can, and with as wide span as we can get, because we think that means freedom for change, too. Everything will be worked on the basis of trying to get those services which we think are going to be permanent in a place where they will do the least harm. From that point on, this other space, when we get through, will be much like loft space. We can change our minds a half dozen times before we get the building built.

"In our office we have developed for the owner a scheme of what we call fundamentals. We don't call drawings 'preliminary' any more because we want to get the owner set in one direction at some time so that we can start the building. If we use the word fundamental, he

has to think of it. When they are developed into very full-scale plans at all, this idea of change is much less important, and the walls, stairs, services, and so forth, are drawn very carefully to quarter scale. All those things that have to do with what we consider permanent and which have a definite measurement of cost which can be accurately made, we put in quarter scale. We make drawings which will fill up sheets of standard size. Then we actually make a measured cost of the structure in that sense, without any of its furniture, without any occupancy in it at all. Then we take an agreed occupancy for the moment and measure the cost on that too. Those are done merely by the linear projection of materials cost.

"When we get through with that, we make the whole thing into a report. We make a model. We continue to make models all the time. We get quite elaborate models, but without too much detail on them in the old-fashioned idea of whether it has a cornice here or there. They are mass studies. We do this type of thing very rapidly. If you want one in a couple of days, we can turn it out. Then we draw up the three-dimensional floor plan showing the division of space.

"When we get through, we put these all into a report. We have our own printing machine to print the covers for the report, and we get them bound with one of these spiral plastic bindings. The whole thing is in this report. You can take it to a board meeting and have full discussion.

"We find that when the owner gets one of these things, he really thinks he has something serious and he has to make up his mind about it. That is quite important. In other words, make up your mind that you have to build now with the knowledge you now possess. We try to tie it up in a nice package, and if it goes to the donor, it goes with a little more dressing. We have found recently that impressionistic studies of point of view are very helpful to the owner. We found an artist who has an architectural sense, who can make quite lovely drawings."

CHAIRMAN BOYD: "I am going to use Mr. Walker's very interesting description as a springboard to plunge right into the middle of the tripartite memorandum (the document asked for at the Columbia, Mo., meeting). The second part of the memorandum prepared by Dr. David has to do with the planning of the library, the relationships between the librarian and the architect, the university administration, the clientele, and so on; how you arrive at a program; how you establish a common ground of agreement and operation between the architect and the librarian.

"It is terribly important that this statement of fundamentals should be clearly understood by the owner as well as by the architect, because in many instances a procedure is begun by which the librarian or the architect establishes a premise regarded as fundamental perhaps by one and not by both, and then a line of development is taken from premise to premise which is not understood, perhaps, by the owner to be that, but it may be by the architect. Then you come to grief. The

students, the alumni, perhaps, do not enter into the distribution of your functional elements. At Princeton, for example, we have been planning a library for fifteen years at least. I think we are now in Plan H or J. Yale went through the whole alphabet, I believe. We have had, at Princeton, a single basic philosophy for the library building that we wanted, but we have developed several very different plans, some of them diametrically opposed, yet all have been enthusiastically and unanimously approved by the faculty at one time or another.

"If it is true that, as long as you satisfy a particular department with its space, the members of the faculty are not deeply concerned about the whole problem, and even less concerned about the thing that Ralph Ellsworth was talking about (the integration of the library as a teaching instrument, as a research instrument, with the whole purposes of the institution), then we have an additional responsibility of focusing our minds on the development of plans, of planning, between the librarian on the one hand and the architect on the other.

"I would like to throw that problem open to this group for discussion. We know the general set-up and the obstacles we have to overcome. The librarian comes into the picture, as is the normal practice, after the architect has been selected. Perhaps he has not met him, perhaps the general line of development has been decided upon before the librarian is consulted. How do we establish that common basis of operations with the best promise of success and with amicable and profitable relationships?"

MR. RUSH: "The important thing here today demonstrated is that yesterday and today we have seen great new libraries being planned from the inside out, whereas heretofore, pretty largely, they have been planned the other way, outside and then inside later."

MR. BURCHARD: "The contemporary architect, it has pretty clearly been demonstrated, does do more research on the inside of the building than he used to do. The more that he does, the more he puts himself in the position of the diagnostician. I expect a good diagnostician prefers than the patient does not know too much about synthesis and does not know symptoms.

"If you believe that thoroughly, if the architect is to do this research, he should do it regardless of what anybody may have written before he starts. The program which had been prepared by no matter how careful mechanism inside the institution, might become so frozen in the mind of the buyer that, no matter how good a research the architect made, the buyer might not want what he thinks he wants.

"There is, then, the risk, in a well established program such as we wrote, that it will freeze the thinking of the buyer to the point where the architect has great trouble in changing the thing later.

"There is a converse situation, however, which I think is equally evil. The architect is not going to administer the building. He has a certain amount of time which, from a financial point of view, he can

put in, that you will pay for. The more you will pay him for that, the better building you will get, I am perfectly confident.

"He does not often have committees like this to deal with in this type of building or any type of building. But the tendency may be for him to fix his own conception, if he is a good architect, a good salesman.

"Therefore, when he has this, when you have not done any thinking of your own and you are not really jelled, then the thing you mentioned can occur. He can come before any faculty, almost any librarian, certainly any administrative group, and put over what he wants regardless of what the librarian thinks he wants. That is equally dangerous.

"I think what we have is the right way, that you should and you must make your own internal study and you must make it hard and tough, just as tough as you can make it.

"You do not make that purely internally. You go around and talk to other people, too, but after you have done that you must not say that the architect cannot spend any time doing the same thing, or that he has to have you along, or that he has to discuss the thing with you at every moment. But you must insist, if you finally come to disagreement, that this disagreement is talked out very fully and thoroughly.

"That puts some onus on the administrator who is trying to pick the building of being able to understand the architect's plan, of not being willing to be fooled by any particular type of presentation which may fool him, of being willing to stand up to his point.

"I would say if you finally come to an absolute and final impasse on a point, it is obviously essential that the librarian decide. After all, he is the person who for a while at least is going to have to try to make the thing go, and a man would do better to try to make his own mistake work than to make somebody else's work.

"It seems to me that that is the solution. The contemporary architect is able to do good research and you should not give him a program and say, 'Build this building.'"

The question was raised whether the librarian should do as much research in architecture as the architect in librarianship. Mr. Burchard said he did not mean to imply that. It was felt the librarian should be able to state exactly what he wanted each type of material or piece of equipment to do for him, and leave it to the architect to make the proper choice of material or machinery.

MR. WALKER: "Wearing quality, for example, should belong to the architect, but the question of whether a floor is noisy or not should be a mutual inspection and agreement between the man who is going to use the library and an architect.

"I think myself if an owner has a definite program and he gives it to the architect, he is engaging a draftsman, because the primary thing that the architect can do for the owner is to help him make this research. We have done several successful ones on research buildings, in which we have started out to help them find out where they are going to put the building first, then what kind of building they are going to put on it. In each case, every move has been made by a joint committee, a committee of our staff and a committee of the owner's staff. We say that the successful building can come only when three people form an intimate partnership from the very beginning really. Those are: a good owner who is open and intelligent, a good architect who has the same qualifications, and a good builder who knows how to build soundly. When you get those three into an active, intimate partnership, you are likely to get a good building. When any of them fail to perform this partnership service to one another, the building is going to fail, in my estimation.

"My successful building has always been when there has been active cooperation from the very concept of the job right straight through to the end, when there has been no buck-passing or alibi-making at any time. Everybody fully understood every step that was made. So I would advise that the architect and the research group and your staffs get to work simultaneously, if possible, and write a joint program.

"A program set down on paper like Mr. Burchard's is only a guide, really. It is only a guide when it is made jointly, too, because of the fact that up to the time when you have to build, your mind should be open to any new phases that may appear and come in to help you to build as good a building as you can. So I advise strongly that you do organize committees and don't put the architect in the position of being a resisting component of your organization."

MR. BURCHARD: "I think I have not made myself clear if I gave the impression that the program which might be prepared by the client should be regarded as the program for the building. It is a guide to the program for the building and is what the client thinks when he first meets the architect."

(Meeting adjourned at 1:15 p.m.)

SUNDAY AFTERNOON SESSION, OCTOBER 28

The meeting reconvened at 2:50 p.m., Mr. J. P. Boyd, Chairman, presiding.

The Committee discussed Mr. Burchard's talk to be given before the Conference of Eastern College Librarians in November. It was unanimously voted that he be authorized to say, from the discussions, anything which he wished and thought discreet to say.

CHAIRMAN BOYD: "Mr. Macdonald had made, for use at Princeton, about 1200 blocks, made to scale, representing a module approximately the size of this module. I found those extremely useful and very entertaining to play with in working out the different solutions to a given problem in the distribution of the mass of the building and so on. I am sure Mr. Macdonald would be very glad to have them sent to you, if you would like to borrow them."

MR. MACDONALD: "For many years we have been carrying a heavy responsibility in connection with libraries. It has been increasing and I have felt more and more inadequate to handle it the way we were organized. In August, I reached the conclusion that it was absolutely necessary that we have in our organization a competent architect and also a competent man who knew all about libraries. In looking around to fill that need, we had the very good fortune to find two men who were just in process of getting out of uniform and into civilian clothes. When I told them what we were trying to do, they were both interested enough to give up the paths of life they had originally intended to follow and to throw their lot into this program. Mr. Bailey is the architect, and Bill Randall is the librarian."

MR. MACDONALD then discussed a stack-carrel problem brought to him by the University of Chicago, and passed out prints of the suggested solutions. At his request Mr. Bailey took up the detailed description.

This was a rather hypothetical problem and not all the local factors that might influence the plans were known. Discussion centered on the floor arrangement. Mr. Bailey used the 23 ft. column spacing in working out his study and stack space solution. Carrels were to have separate partitions of sound-absorbent material, but study areas were to be flexible, for carrel or other uses. The 23 ft. module allows the possibility of a small motion picture room to seat 50-60 people.

Mr. Bailey then brought up the matter of ceiling height by suggesting that there were low and high limits for long, large reading rooms, unrelieved by furniture division into small units. He felt the need for height was intimately connected with furniture arrangement.

MR. BAILEY: "Mr. Walker mentioned that he was going to use glass partitions and map walls and other things to break up long spaces so that when people came through from one building to another, they would not in any way disturb those who are trying to read."

MR. BURCHARD: "We are worrying about that question and I should also like to hear something about the equally pertinent matter of control. It is true that the desk attendant will not be able to see throughout the room. For example, she could not detect anyone cutting a plate out of a book. Is that serious now, or isn't it? I should like to hear from people who have had more plates cut out than we have."

MR. ELLSWORTH: "Mr. Burchard, when a student borrows a book from M.I.T. and takes it home and cuts out a plate, you do not know it. Why all this worriment about their going to a reading room to cut a plate out?"

DR. DAVID: "At Pennsylvania you take a book out and sign your name for it. If a plate is cut out you are immediately under suspicion."

MR. ELLSWORTH: "There are maybe four names on the card. Who cut that out? Are you going to take the trouble, and cause the ill will that you are going to cause, to run that thing down? The answer is that you are not. You are going to make all four people very angry."

MR. HAMLIN: "I don't think there is a library in existence so well guarded that a fairly intelligent person cannot cut out the pages of a book that he is using."

MR. METCALF: "I wonder if it is not fair to say this. Of course, a person can steal a book if he wants to. He can cut a plate out if he wants to. However, at least to prevent considerable theft and mutilation, you have to go to more expense than any of us is ready to go to.

"On the other hand, there are two things that you can do to prevent it. You can build up a proper public opinion, and I think we have all to watch and do what we can there. In the second place, it ought to be made evident to the student that you want to prevent it, that you are worried about the loss of books.

"We have -- and I still feel that we have made the right decision at Harvard -- a turnstile at the door. It does not prevent all theft, but it has prevented nine-tenths of the loss of books that we were having before. You have to have a man at the door, anyhow, in a big and complicated building, and that prevents a good share of the difficulty. It is the cheapest way to do it, and then you do not need to worry about supervision all over your building. It seems to me that if you plan your building so that you do not have a central control point and can give no supervision whatever, you are bound, sooner or later, to get into serious trouble."

MR. HARBESON: "If you will think of this University of Virginia reading room (visited by some members of the conference on Saturday afternoon) having 225 seats, presumably that was the number of seats that were requested. You could not divide that room and have 225 seats without increasing the size of the room or the size of the building."

MR. BAILEY: "Then, too, the possibility of monotony in that room should be considered if you are thinking of architecture. I feel that that was not what you would call a good proportion for a reading room, even though it had a 15-foot ceiling. It either should be very monumental or very down to scale for reading. If you have very nice proportion, very large, very beautifully done, I would like that. Otherwise I would prefer to be in a small room like this, where it would feel like home, not in one that is in poor proportion. That is the way I felt about that particular room."

MR. BURCHARD: "We can return now to this scheme for a moment. What is the relation of the library here to the place where the rest of the work in physics and chemistry is done, namely, the laboratory."

MR. RANDALL: "We just don't know."

MR. BURCHARD: "Then I think it is really entirely unrealistic for any experimental science. Unlike the social sciences or the humanities, the library is a tool to the laboratory and the laboratory dominates. One uses the library for three purposes. First, at the beginning of a piece of work, a careful man would make a literature survey. For this, he could visit such a library as you are here proposing and work there for many hours. Subsequently, however, he moves from the bench to the bookshelf and back very often, and usually for rather short times in the library, to get a clue here, a warning there, a piece of information somewhere else, to check up on things collateral to those he is doing. To design a scientific library away from the laboratory, and especially with no idea where the laboratory is going to be, is to create a partial vacuum except for theoretical science in which such a thesis might be tenable."

MR. MACDONALD: "Maybe we should go further than the question posed to us. He said on one floor he wanted to house four collections of books that would average 25,000 each, that those collections of books would never get any larger than that. When he added more books, he would discard older ones. He also wanted an average of a hundred students for each of those departments, in close connection with the books of their department, and also within reach of books of other departments."

There was considerable discussion on corridor widths, carrel size, and floor space allotments.

Chairman Boyd then called on Mr. Powell to present the Missouri plan.

MR. POWELL: "This building occupies a lot between the two campuses, the old and the new campus of the University, and the entire lot, some 400 or more feet, will be given over to library purposes. We have to provide space for the State Historical Society, and we are prepared to give them some very desirable space. If we should need this space on the first floor, we could take it over and without too much trouble make the adjustment for our own use of it. We have this build-

ing already, so we have some definite commitments here in the beginning. Our problem is to fit on that lot a library that will provide about twice as much space as we have at the present time, about four times as much stack space."

Mr. Powell's plan had been presented at a previous meeting and not redrawn since then, so his presentation was limited to the several changes made.

Mr. Ellsworth changed the discussion by commenting on the pulling of a window shade by one of the men present. It was explained that the sun was shining in his eyes.

MR. ELLSWORTH: "Suppose you had carrels. What would you do, pull the shade? Just imagine. Approach your building from the outside, now, in terms of what Mr. Walker was saying this morning. Sheets of glass windows from top to bottom. Half the shades are drawn, half are not. Maybe half the Venetian blinds are pulled and half are not, and half are tipped and half are slanted. You get a crazy effect. That was the difficulty we had in the Boulder Library. We put in Venetian blinds and from the outside of the building it looked like a hodgepodge. It was terrible. The method you suggested will keep out the heat, but it won't keep out the light. I am just pointing out that you have a real problem from the exterior of the building as to what it looks like if you are going to go in for quite extensive use of windows."

MR. BURCHARD: "There are ways of controlling the light on an area of glass universally now. You will be interested to look at the Brazilian Ministry of Information, for example. They have a very bold architecture."

MR. RUSH then presented the building program at North Carolina in a written report. There was no discussion following his brief remarks, as it was necessary for him to catch a train. "Our building is precisely like the one you have just seen. We want to do the same thing Mr. Powell wants to do, double the space and quadruple the stack space. To do it, the present estimates are now more than a million, and North Carolina never has built any building at a cost of a million. This is merely an enlargement of a present building which seems to be quite adequate to the average person in the legislature."

DR. DAVID was then called upon to report progress at Pennsylvania. "Since we met in Missouri, the building planning at the University has occupied very little of the Director's attention because he has been involved in other problems which for the moment seemed more important and more pressing. The matter has, therefore, remained in the hands of the architect, who is here with us today, and I honestly do not know what the architect has done and has to show us."

MR. HARBESON: "Our program has not advanced as far as those that you have seen. There is still a good deal of settling down to be done. The University is in a large city, which, of course, has implications in the library problem. It has been necessary to keep out a good

deal of undesirable population. Therefore, the stack will be a closed stack, open to certain privileged people and the faculty, but not to the incoming undergraduate students. The only site that seems available for the library is the site now occupied by the library, which, of course, presents some problems of construction.

"Being held by a street and by a campus, the size of this thing is limited and somewhat fixed. So we come to the general space of the building itself, which is reduced for that reason.

"The main floor must be a circulation desk, a large reading room which seats 400 readers, a periodical room seating 200 down this hall, a bibliography room and bibliographical center, which must be on this floor adjacent to the catalogue, and there is quite an enormous catalogue, because it contains three -- the University Catalogue, the Philadelphia Regional Catalogue and the Congressional Library Catalogue. The cataloguing must also be adjacent to this bibliographical function and to the catalogue and to the circulation desk and to the accessions department and the librarian and such small things as cloakrooms and checkrooms.

"One thing which has been omitted from this plan and required by the program is a browsing room, which has to find its place in these plans on the second floor.

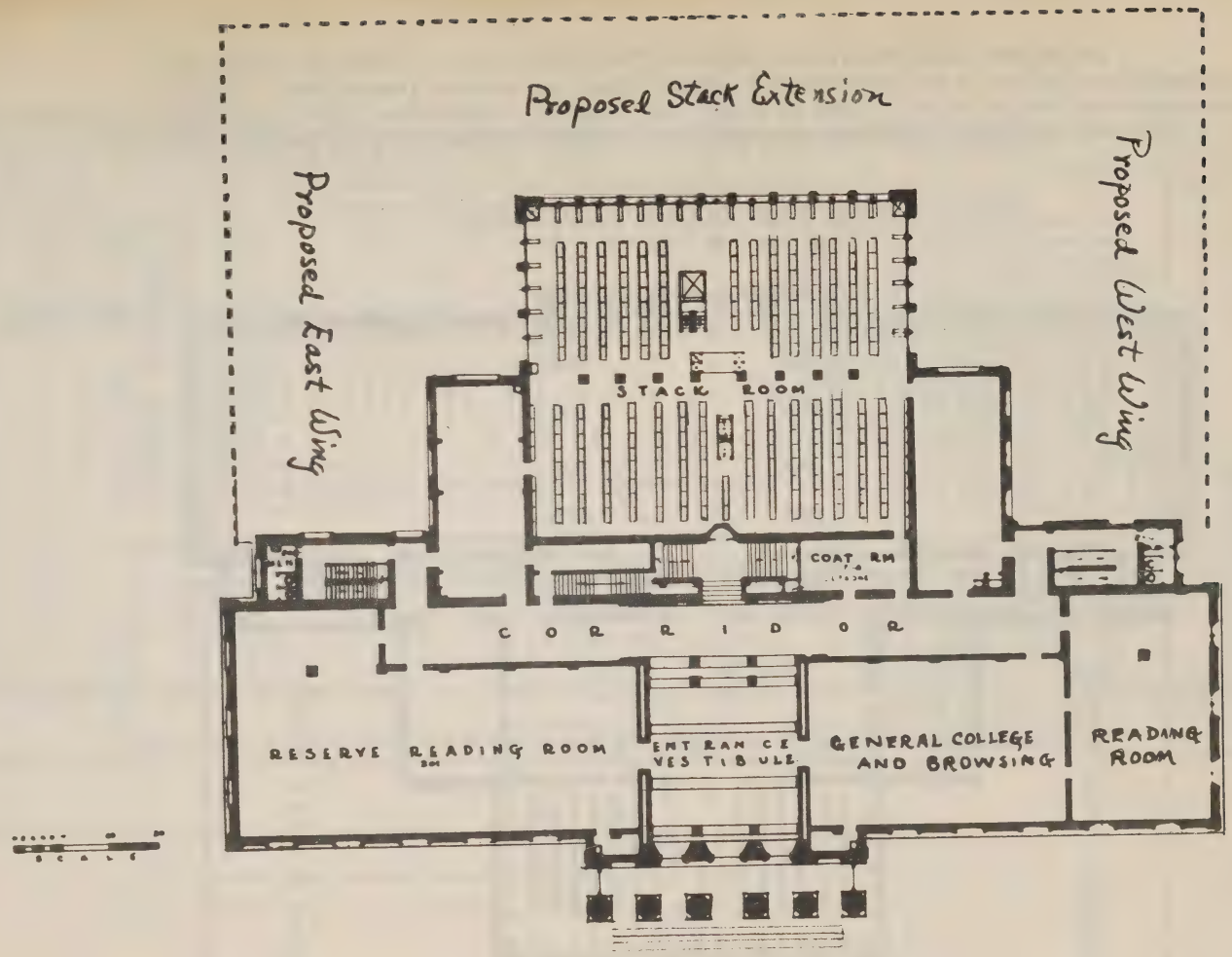
"This is based on the same module at present as the Princeton plan within this stack structure, and around that there is another element which is flexible, in the sense that there is no need for any fixing of partitions within that. So anything could move back and forth but the span is greater than in this module.

"The second floor contains mainly special collections. I had originally intended that this part of the plan would be three stack floors high, at the 7 feet 6 level. Dr. David has been rather urgent that the cube of the building be kept down as much as possible and that that third stack floor should be sifted out of there, and it has been, in this case. So those large rooms are now only two stack floors high. Due to this module system, the actual stack per stack floor is now 9 foot 6, instead of 7 foot 6, so the two stack floors are a little higher than they would have been otherwise.

"On the second floor, the Furness Library of Shakespeare, the University Archives connected with the stack, the browsing room close to the stair, the Lee Library, Rare Book and Treasury Room, some seminars, and the education collection are located.

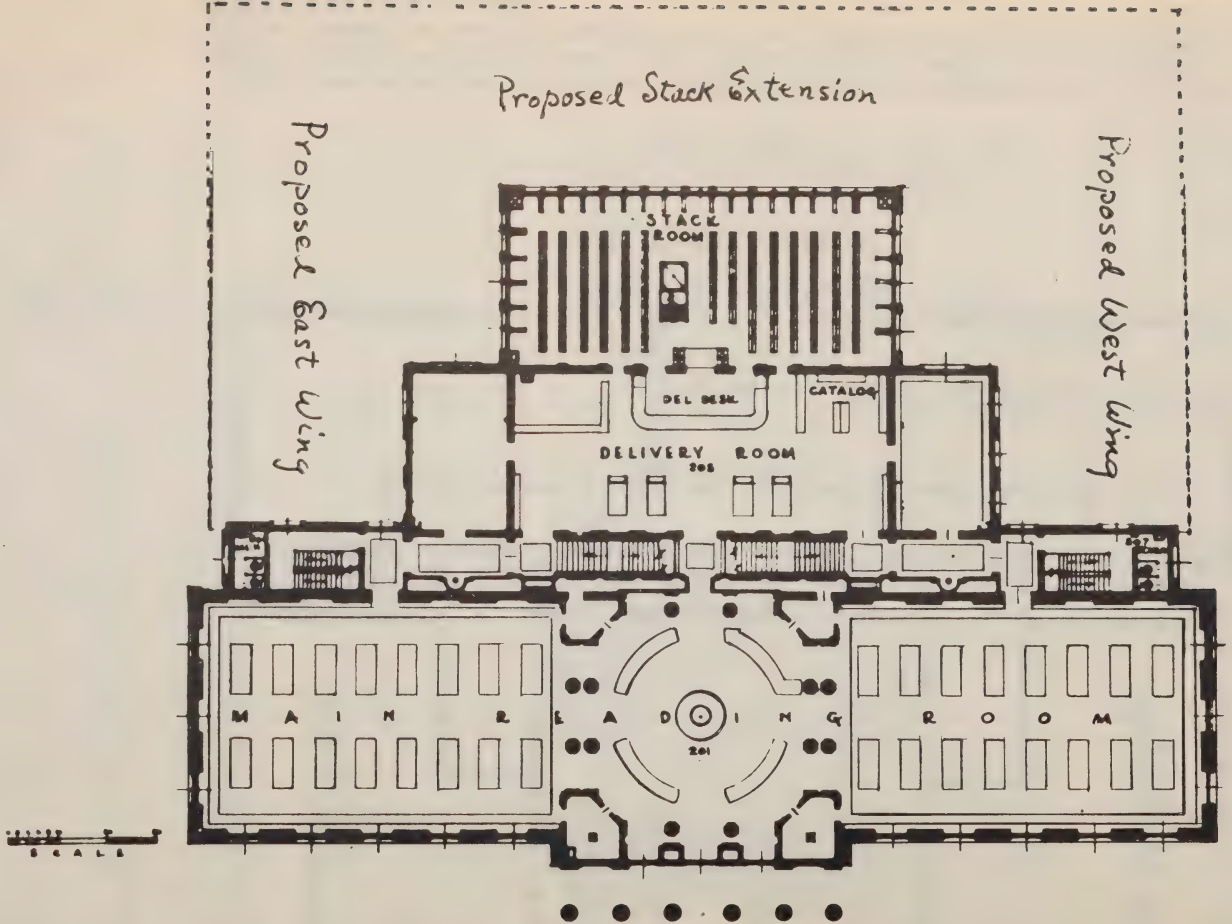
"If we can go from the second floor down to the ground floor, which is again just one floor removed, the reserve book room at the base of the stair, and the Lippincott Library are located.

"The third floor contains the general seminars. They are all served by the stack around them.



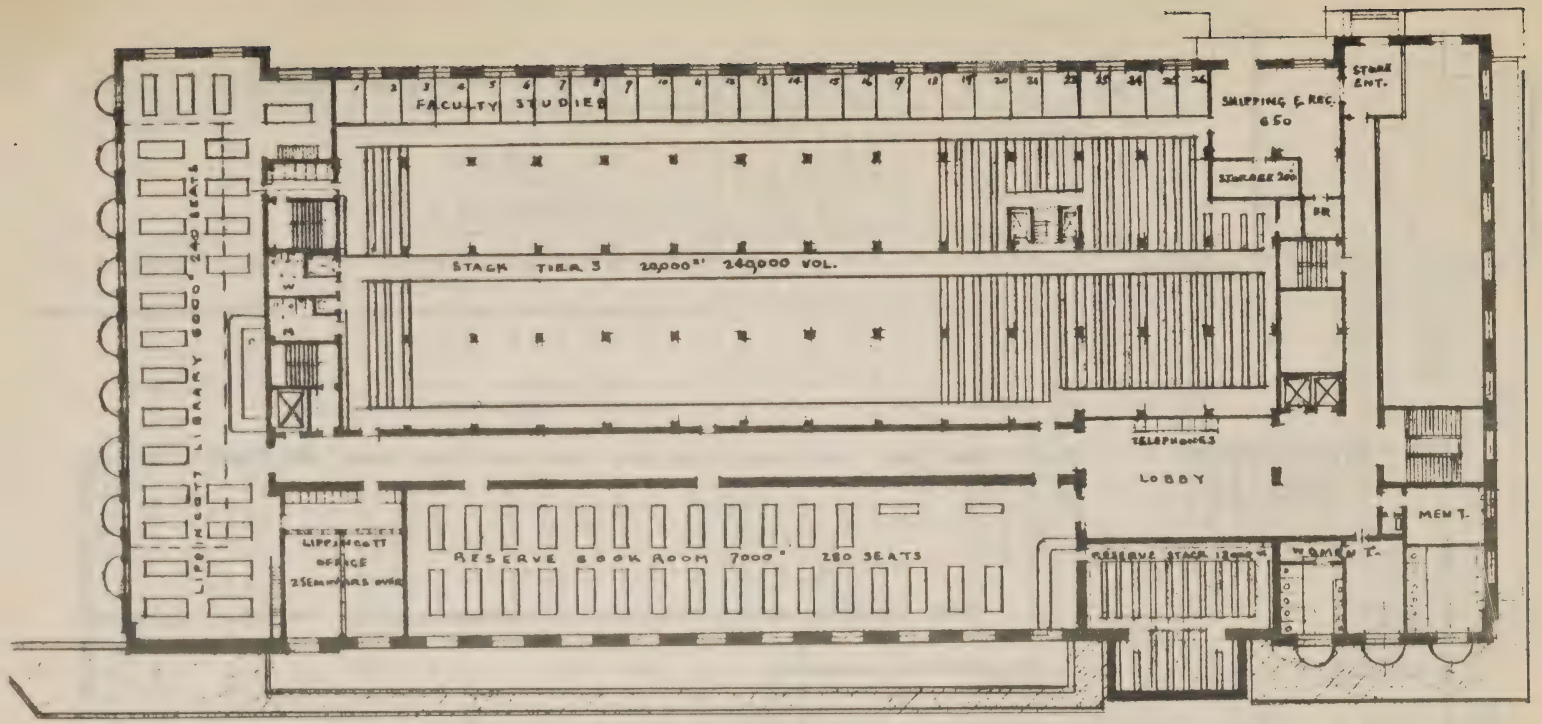
UNIVERSITY OF NORTH CAROLINA LIBRARY
FIRST FLOOR PLAN

Dark lines show present structure. Dotted lines show proposed addition. East and West wings, each four floors high. Stack extension, with 10 or 12 levels. Expansion depends on amount of appropriation to be decided early in 1947, which may be $600,000, more or less.



UNIVERSITY OF NORTH CAROLINA LIBRARY
SECOND FLOOR PLAN

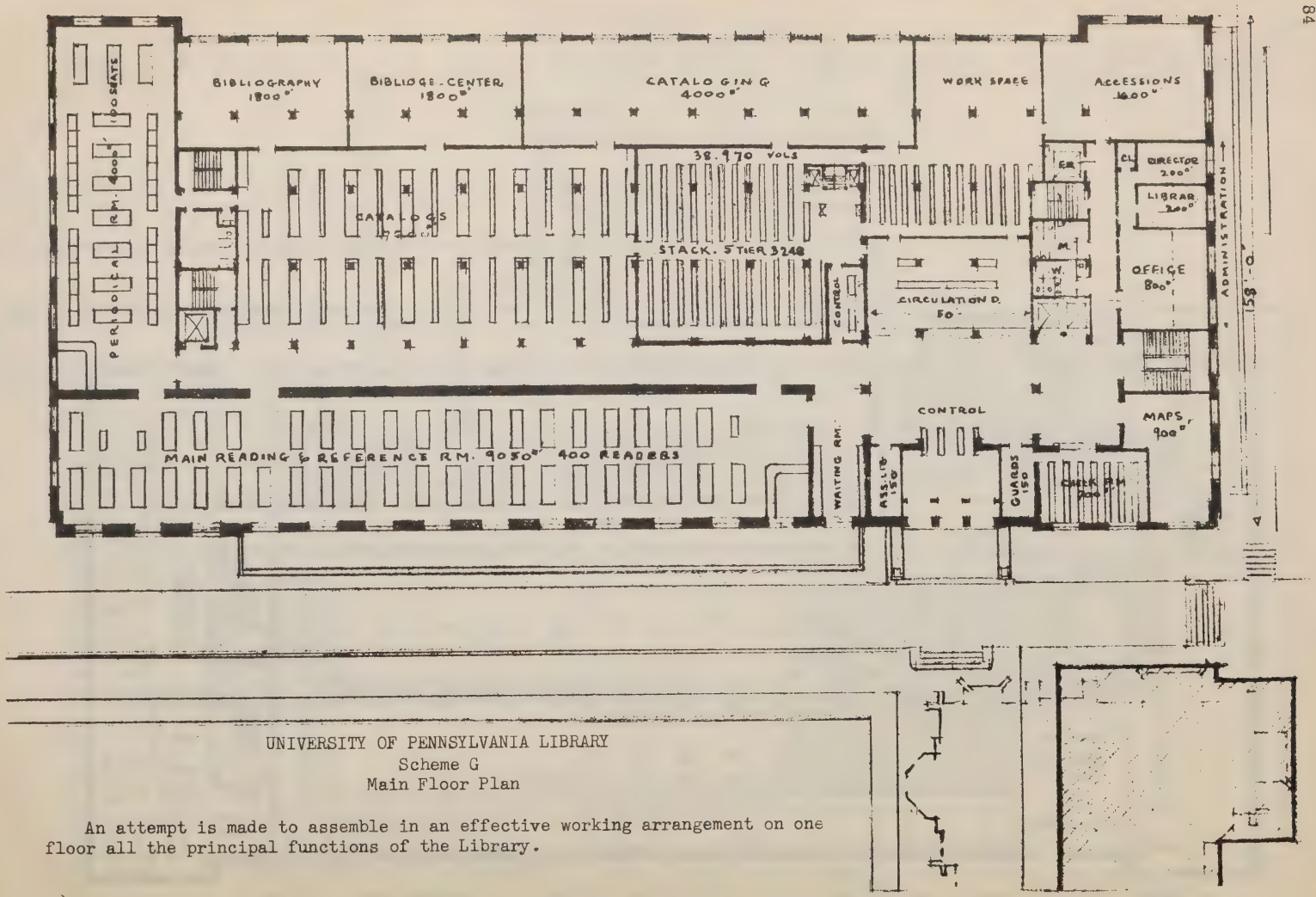
Dark lines show present structure. Dotted lines show proposed addition. Note areas which will be darkened. Query: Can these be made livable without air-conditioning? Can present portion be conditioned? Can new portion alone be conditioned? What should be done, if only half adequate appropriation is made available?



GROUND FLOOR PLAN

UNIVERSITY OF PENNSYLVANIA LIBRARY

SCHEME G 3



UNIVERSITY OF PENNSYLVANIA LIBRARY
Scheme G
Main Floor Plan

An attempt is made to assemble in an effective working arrangement on one floor all the principal functions of the Library.

"The University is not conservative to the extent of insisting on any style on the outside. There is no limitation put upon the exterior of the building, other than that the materials of the other University buildings be followed in this. This need not be Gothic or classic. It need not be anything but a factory, and as you see, it is somewhat like a factory at the moment in its present disposition.

"In the basement there are the mechanical apparatus, the janitor, and so forth, and more stacks."

DR. DAVID: "This is a situation in which the Director of Libraries had ideas that he thought were important, and those ideas have so far been willingly accepted. I was particularly insistent at the time the program was written that we get on one floor those things which I deem it essential to have on one floor. That has more or less set the pattern for this building. The architects have taken the limited space in which they found themselves physically confined and have made a really magnificent effort to assemble those features for which I asked on a single floor. Then they have gone ahead and done the rest of the building as they could, after that requirement was met.

"The program, as I remember it, called for the whole processing of the books, accessions and cataloguing on the main floor; all the card catalogues that are assembled in this great library are there. And when you consider that we have the Union Catalogue of the Philadelphia area, and the Library of Congress Catalogue, which also has had additions made to it, and the University catalogue, that makes an enormous collection of cards. They are all on that floor, in the most convenient juxtaposition to the working area we could possibly have. So, too, is the circulation desk, the bibliography room, and the general reference reading room. Those are the big essentials that are all drawn together there."

CHAIRMAN BOYD then expressed gratitude to Messrs David, Ellsworth, and Metcalf for their Three-part Memorandum. He had called Pres. Dodds' attention especially to the philosophical discussion on the question of architect-librarian relationships. He had replied that he was perfectly delighted to see librarians thinking in broad terms and in terms of the objectives of their institutions.

CHAIRMAN BOYD: "I think we have to continue to think in those terms. One of the obvious things about all the re-shuffling of the post-war curricula that is going on — and I do think it mainly re-shuffling — is the fact that nowhere in any of the discussions I have seen is there recognition of the fact that every decision made in that revision of curricula involves libraries, has consequences for libraries. I think the implications there are not even recognized, much less understood.

"So we must, at future meetings, it seems to me, give some real attention to this program.

"I should like at this moment to turn to Mr. Macdonald to see if Snead & Company is prepared to give us any information on a comparative basis of the cost of construction of this kind, this method of

construction. Can you tell us anything about your cost analysis of this method of construction?"

MR. MACDONALD: "We can give you a cost analysis of storing books in a modular system such as we have been discussing, and storing them in a book stack, such as we have all been used to for many years. We can also give you a comparison of the cost of a modular system with the hollow columns and girders and flooring so as to take care of all the air passages with, say, the typical modular office building construction, which is, you might say, the basic skeleton.

"It is hard to compare the cost of such a modular system as we have been discussing with a typical library building such as we have known in the past, where there was a good deal of monumentality about the interior, except to say that the modular system will tend greatly toward economy. I made a statement yesterday, or half made it, that in a 45-foot building, there are ordinarily three 15-foot stories such as we have been accustomed to in the past, and there could be five 9-foot stories in a modular system. There is no necessity of having a modular system with any particular ceiling height. It can be whatever is found to be best in the opinion of those involved.

"I would recommend that the ceilings be kept as low as is fitting, because there are many economies in so doing. For instance, the foundations of the building are inexpensive. The foundations are not so different for a five-story building with a light construction and a three-story building of heavy orthodox construction. The roof is the same, whether it is five stories or three stories. The outside walls are essentially the same. Elevators and the heating plant are the same. Those factors which depend upon human occupancy, of course, are increased with the number of square feet, but I think it is very safe to say that, as far as you want to use the modular system, you can erect in 45 feet a five-story building at the same cost per cubic foot as you can erect a three-story building with monumental interiors, or at less cost. If you want to get some actual figures, the head of our estimating department has prepared some and he will give them to you in dollars if you would like to have that."

CHAIRMAN BOYD: "I wanted to ask whether you met the kind of problem in cost analysis that Princeton and Pennsylvania will ask you to meet, where we have a combination of uniform ceiling height stack levels surrounded by other elements calling for a greater span than you contemplate in a unit such as this. Can you meet that?"

MR. MACDONALD: "The modular system has the great advantage of permitting the economies of quantity production. To the extent that you can follow it you realize those economies. To the extent that you have to get away from it, they won't be realized. There is no reason why, as I understand your problem and Mr. Harbeson's problem, there could not be a combination of modular system and the type of construction we have been using in the past."

CHAIRMAN BOYD: "I am certain that I need offer no resolution in expressing to Snead & Company and to Mr. Macdonald, Mr. Walton, Mr. Bailey, Mr. Randall, and to all other members of the Company, our very profound appreciation for the service that you have done to the library profession and to the profession of architecture, in setting up this model, and particularly our gratitude for your very gracious and very expansive southern hospitality. We have enjoyed ourselves immensely, and I call for a show of hands." (Applause)

Expenses for the conference were discussed and an agreement was reached on the problem of editing the minutes. A request for material to be published in an architectural magazine was discussed. Other business included plans for a meeting in the spring of 1946, possibility of a grant from one of the philanthropic foundations.

Mr. Kerr made a brief statement on the status of the building plans at the Claremont Colleges, and Mr. Quintana on those at Wisconsin.

CHAIRMAN BOYD: "Mr. Kirchhoff told us that he had received sometime ago a communication from a patient in a state institution suggesting that he really shouldn't plan building for such an institution unless he himself had once been a patient in it. (Laughter). He suggested, therefore, that this group might think about the idea of including the student, the undergraduate or someone who might be called the typical undergraduate.

"At this meeting we have had the head of an institution represented. It is very gratifying to all of us that President Hancher took time out from his many duties and responsibilities and came here to join us in this discussion. I think at this meeting for three days President Hancher has given us the impression that the library is one of his chief concerns, if not the concern in which he is most interested. That has been very pleasing to me, and I am sure it has been to the entire group. I would like to put President Hancher on the spot by asking for a few general remarks."

MR. HANCHER: "Mr. Boyd, I am very happy to have this opportunity, first to express my appreciation to the group for their tolerance and willingness to accept a mere administrator into such a distinguished body. I think you remember Mr. Howe's remarks about administration the other night.

"Next, I should like to say that the trip has been very much worth while from my point of view. I told you privately that I thought it desirable for this group not to get too large, and, therefore, if I were in your position, I wouldn't advise too many presidents to be here at one time. They might even cast a sour note into the proceedings. But I do think that if you could get a representative from the several institutions, from time to time, to come here he would learn a great deal. I would testify to that from my experience, not only because of the fine information which we got, of a technical character, on Friday, but because it has given me an opportunity to get something of the point of

view of the several institutions involved, and given me, I think, a little perspective in judging what things may be relevant to our institution and what not.

"We have some proposals made from time to time that we ought to do a certain thing because it is done elsewhere. I think this has helped me get a little perspective on the controlling considerations in the institutions represented here, so that I may judge better the validity of such proposals.

"Also, I have greatly appreciated the very frank way in which you have discussed plans, and I think that I was able to pick up a little background which may have come from preceding meetings.

"It is a very hopeful sign, I think, when men who are interested in the same field get together and exchange ideas. I am a fairly recent arrival in the field of education administration, having come in by an unorthodox route, and I should like to say that I have been very much impressed by the willingness of people in all fields of education to exchange ideas. I understand that this is the first time that people in the library field have gotten together on such a large scale and in such an important project. It is a very hopeful sign and very much worth while.

"Therefore, I would suggest that you extend cordial invitations to representative presidents or presidents whose librarians are a regular part of this Committee from time to time. I am certain they will gain as much as I have and that will be a great deal.

"I might say the educational philosophy which has crept out here has been of value to me, too, because it is quite clear that the institutions have varying approaches to their problems, but always the library, it seems to me, is being thought of in terms of the educational philosophy of the institution, which is vitally important."

MR. MACDONALD: "I would like to say one thing before you adjourn. What you all have given us is far and away more than anything we have given you, and we appreciate it and hope that you will understand that you are all very welcome any time in any way we can be of service to you. I think this is the most constructive thing I have seen done in the library profession in connection with the building problems. This thing is infinitely valuable. I think you all are going to get somewhere and I think the generations to come are going to bless you for it.

"I wish you all God speed and come again."

CHAIRMAN BOYD: "Thank you very much." (Applause)

(The meeting adjourned at 4:50 p.m.)

Charles W. David, Secretary